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[ORIGINAL COMMUNICATION.]

AN IMPROVED DRYING OVEN.

BY CHARLES RICE.

FOR the past four years I have constantly made use of the drying-oven here illustrated. I had previously used various forms of steam-closets or drying boxes, but none appeared to be entirely free from certain disadvantages, considering the work expected of them. In designing the form here described, my object was to enable me to use either steam or some hot liquid as a source of heat, and to arrange it so that it would perform its work uniformly and automatically, without having to be watched. As I desired to have it available for steam, it had, of course, to be constructed of rather stout material to resist the pressure.

The apparatus has the usual shape of the laboratory drying-oven. It is constructed of stout sheet copper, has double walls on all sides (even the door has double walls, but the space between them is here filled with asbestos), and the parallel sheets forming each side are held together by carefully placed rivets, which serve at the same time to prevent the sides from bulging when steam is used.

The space between the walls has two inlets and one outlet. The outlet is at *B*. At *F* there is an opening which may be closed with a plug. And at *A* a steam-pipe enters the apparatus.

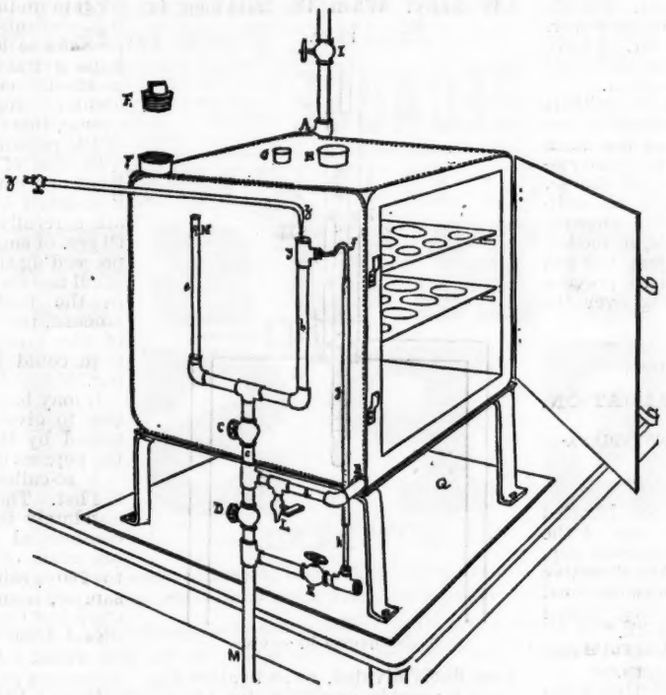
The two tubulures *G* and *H* communicate with the interior of the drying-oven. One of these is intended to hold the thermometer, while the other serves as a chimney for the escape of the volatilized vapors arising from the substances which are being dried.

While speaking of the thermometer, it might be remarked here that its indications may be rendered much closer to the true temperature existing within the box, if the escaping vapors are made to pass the whole of the stem of the thermometer so that it will be constantly surrounded by a current of the hot vapor arising from the oven. This may be accomplished by inclosing the thermometer (*a*, Fig. 2) in a rather wide glass-tube (*c*), open at both ends, a couple of notched corks (*b*, *b*) serving to keep the thermometer in position. The wide glass-tube is fitted air-tight into a cork (*d*) in the larger tubulure, while the other tubulure is closed with a cork. If the upper orifice of the wide glass-tube is connected with the filter-pump, and the latter be made gently to aspirate the hot air or hot vapor arising from the drying-oven, the substances within the latter will be dried much more rapidly. In order to be able to see the rate at which the aspiration of the vapors takes place, it is best to draw them first through a bottle containing water or some other liquid where the rate at which the bubbles are passing renders the current of vapor or air visible to the eye. The current should not pass too rapidly, since the fresh air entering the drying-oven at the edges of the door would not have time to acquire the full temperature of the oven. Provision might have been made to cause all fresh air thus entering the apparatus to be previously dried and heated, but this would unnecessarily have complicated the apparatus. In my experience, it was found not to be necessary.

The outside of the drying-oven, except at the bottom and over the door, is covered with a thick layer of asbestos felting, snugly and carefully applied. This serves to reduce the loss of heat by radiation to a minimum.

The inside dimensions of the oven are:

FIG. 1.



Rice's improved drying oven.

Width	13 inches
Length	13 "
Height	16 "

and the walls are one inch apart, except at the bottom, where they are one and one-half inches apart.

The outlet at *B* has several connections, as will be seen from the cut. If the valve *D* is closed and *C* is opened, and water is allowed to run into the open T-piece *y*, it will descend and enter the apparatus through *b*, *c*, and *d*. At the same time, the level of the liquid inside of the walls will be indicated by the glass gauge *e*. Should the volume of water within the walls be such that it would rise to the level of the bent glass-tube *f*, this would act as a siphon and draw out of the T-piece any excess of water, thus preserving the level exactly at *N*. The surplus water runs down the tube *g* and *k*, and, the valve *E* being open, finds its way into the waste-pipe *M*.

The supply of water for the T-piece *y* is brought by any suitable conduit, such as *z*.

The plug belonging into the orifice *F* is never inserted except when steam is used for heating the apparatus

Under ordinary circumstances it is not possible to attain, or, at least, to maintain a temperature of 100° C. (212° F.) by means of plain water raised to boiling by a gas flame placed below the apparatus. To permit a large range of temperature, from a gentle heat to considerably beyond the boiling point of water, it is advisable to charge the apparatus once for all either with a saline solution of proper density or some other high boiling liquid. I have used a mixture of equal volumes of glycerin and water for several years, and this has given me every satisfaction. The water which gradually boils away is replaced by fresh water constantly supplied through *z*. In its descent through the pipes *b*, *c*, *d*, it becomes gradually heated, and by the time it finds its way into the chamber at *B* it has acquired the temperature of the interior, so that it cannot chill off the liquid already there. The glycerin would very gradually become volatilized with the steam of the water escaping from the orifice *F*. But this may be prevented by inserting into the latter either an upright condenser or simply a long glass-tube held by a cork. The steam, during its passage through this tube, will become sufficiently condensed to cause any glycerin carried along with it to find its way back into the apparatus. A glass tube, intended to serve as a condenser, will be found to work so much the, better the less direct a way it offers to the vapors to escape—without, however, offering any resistance. A few zig-zag bends made in the tube will answer every purpose.

The tubes *f* and *k* are of glass, to permit the rate of overflow being seen.

The drying-oven stands on a solid iron frame on legs, and a piece of stout asbestos felting, *Q*, is interposed between it and the table, to prevent the latter from being scorched by the long-continued heat.

When the apparatus is once started, and the proper temperature has been reached by adjusting the flame which heats it, it may be kept going for weeks without requiring any further adjustment. If the gas supply comes directly from the meter, there may be a necessity of regulating the gas flame both at night, when a greater pressure is put on at the gas-house, and in the morning, when it is reduced. But even this may be avoided by applying a gas-regulator to the meter in the house or laboratory.

If it is desired to empty the apparatus, the supply of water at *z* is shut off, a rubber tube attached to the stop-cock *L*, and the latter opened, when the contents may be received in a vessel placed below.

The use of a naked flame below an apparatus of this kind is sometimes risky, particularly when ether, benzin, or other inflammable liquids are to be evaporated off. In such cases it is very convenient to be able to use

steam, and it is just for such occasions that I intended to use it. When steam is wanted, the apparatus is first emptied in the manner stated above. Next the valves *E* and *C* and the stopcock *L* are closed. The plug *F* is tightly screwed in, and steam cautiously turned on at *I*. By carefully regulating the inlet and the outlet (at *D*), the proper pressure and temperature may be obtained. If it is known that the pressure obtainable from the boiler cannot exceed that which the apparatus is capable of standing, a steam-gauge or safety-valve may be dispensed with. But it is always safest to use these, and it is absolutely necessary to do so when the boiler can make steam of higher pressure than the apparatus can bear. The steam-gauge and safety-valve, suitably combined by fittings, are screwed into the orifice *F* in place of the plug.

The inside of the oven is provided in the usual manner with several movable shelves made of sheet copper, and perforated with suitable holes for receiving funnels, etc.

If it is *not* intended to use steam in such an apparatus—in which case sheet copper of about $\frac{1}{16}$ inch in thickness will answer—the expense of constructing it will not be great. The advantages of the apparatus, however, outweigh the expense by far. I have had it sometimes going for eight and ten weeks without interruption.

Those who wish to combine with it a contrivance for maintaining a constant temperature, such as has been illustrated and described in former issues of this journal, may, of course, add this feature to it. For all ordinary work the apparatus answers perfectly well without this, if moderate care be taken to adjust the gas once for all properly, and to prevent cold draughts from passing over the apparatus.

[Original Communication.]

PEPSIN AND ITS VALUATION.

BY FRANK S. HERETH, OF INDIANAPOLIS.

The U. S. P. recognizes saccharated pepsin only, and not any of the forms of so-called concentrated pepsin, and defines it as "the digestive principle of the gastric juice obtained from the stomach of the hog, mixed with powdered sugar of milk."

Following this are the tests of identity and of digestive strength.

The assay process is defective, however, in failing to designate the degree of fineness to which the coagulated albumen should be reduced before submitting it to the action of the pepsin. This is important, since different results might be obtained from the same pepsin, using albumen of different degrees of reduction.

It is required to dissolve at least fifty times its own weight of albumen.

The requirements of the British and German pharmacopœias are very low, considering that, from their titles and wording, they are not saccharated pepsins, but the ferment itself in its purest obtainable state.

The B. P. alone of the three pharmacopœias gives a method of preparation, that of scraping the previously cleaned mucous membrane with a blunt knife or other suitable instrument, and drying the pulp thus obtained on glass plates, at a temperature not exceeding 100° F. The requirement of its digestive strength is very low indeed, considering that it contains no added substances—one grain being required to digest but fifty of coagulated albumen, while the U. S. P. article will dissolve the same amount, though it may contain many times the weight of the contained pepsin in sugar of milk.

It seems a little remarkable that so late a revision as this should adopt this old and, in this country, long superseded process. Probably no pepsin is made in this country by this process, all true ones being made by Scheffer's process of precipitation.

The German pharmacopœia, like the British, names the article simply pepsin, and recognizes no admixture with sugar of milk.

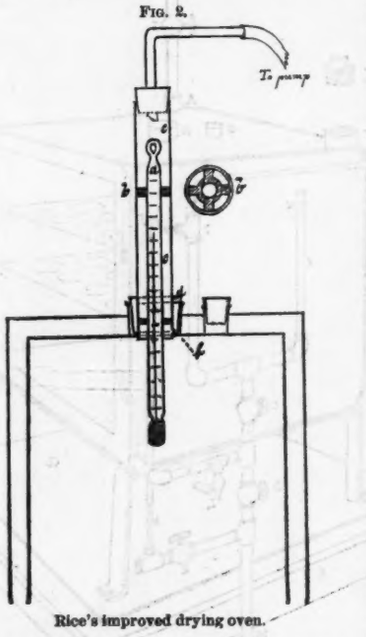
It is, however, required to possess a greater digestive strength, one part digesting 100 parts of albumen. It, also, prescribes the degree of fineness to which the albumen should be reduced, as does also the B. P.

It has always been a matter of some difficulty to test pepsin with a satisfactory degree of accuracy.

First. If the albumen is submitted to the action of the pepsin in the state of large pieces, it may be easy to separate and weigh the undissolved portions, but in the coarse condition it cannot be favorably acted upon by the pepsin, since so little surface is exposed, besides which drawback, there is that of the pieces becoming peptonized on the surface and preventing the action of the pepsin upon the interior.

Secondly. When the albumen is

Fig. 2.



Rice's improved drying oven.

very finely divided, so as to allow the most favorable condition for the action of the pepsin, it is impossible at the end of the process to accurately separate the undissolved portions in condition for weighing.

To those familiar with the process as generally carried out, no further elucidation is necessary.

It was these difficulties that led to the adoption of the following process, which I have successfully used during the past year with uniformly satisfactory results, so as to be left in no doubt as to the power of the pepsin employed, and by means of which the troublesome weighing is dispensed with.

For the assay of saccharated pepsin, five two-ounce wide-mouthed vials are provided, and into each of them is weighed just one grain of the pepsin to be assayed. A quantity of water and hydrochloric acid, in the proportion recommended by the pharmacopœia, having been provided, 507½ grains are weighed into each bottle, or a measure, graduated so as to hold 507½ grain-measures, used for measuring it into them.

The albumen from an egg, which has been boiled fifteen minutes and then cooled, is carefully separated from the yolk, and by means of a small spatula forced through a piece of brass gauze of 80 meshes to the linear inch.

The albumen is then quickly weighed in portions, placing 20 grains in one vial containing the pepsin solution, 30 in another, 40 in another, 50 in another, and 60 in the last. The vials are then corked, and the number of grains of contained albumen marked on the cork of each bottle, when they are placed in a water-bath and kept at 100° to 104° F. for four to six hours. They should be placed in a part of the bath remote from the source of heat if a direct flame is used, as the bottom of the vials, being in contact with the metal where the flame strikes it, would be much warmer than the water contained in the bath. It is preferable, where a steam water-bath cannot be used, to place the vials in a second vessel, immersed in the bath proper.

It is necessary to shake the vials frequently, and to also remove the corks occasionally.

When the proper time has expired, the vials are removed, allowed to deposit all undissolved albumen, and the eye can readily read the result.

In some cases it may be found that all the albumen in each vial is entirely dissolved, and in others that they all contain undissolved portions in varying amounts, the one in which was placed the least containing but perhaps a trace, and from this to the greatest containing progressively greater amounts undissolved. Of course, this depends upon the activity of the pepsin.

In case of desire to assay an undiluted or "concentrated" pepsin, $\frac{1}{10}$ gr. is weighed into each bottle, or 10 grs. are carefully and well triturated with 90 grs. of sugar of milk and 1 gr. used, proceeding then as above. In case of small amounts of albumen remaining in the bottle containing the least amount, the eye soon learns to judge of the amount far more accurately than could be determined by weighing.

It may be interesting in this connection to give a few of the results obtained by this process with some of the pepsins of the market.

A so-called "Turkey pepsin" leads the list. That is, it was found to be absolutely inert. Several samples of commercial pure pepsin were found, one grain of which would dissolve 500 to 700 grains of albumen, and one sample, manufactured by the Royal Chemical Co., New York, was found to digest 1,150 grains. This is the highest result I have ever obtained from numerous careful tests.

One of the "scale pepsins" of the market was found to dissolve 157 grains of albumen, while another sample from the same firm dissolved 350. In fact, there are just as many degrees of strength of "concentrated" pepsin as there are lots made, since the same conditions cannot always be met with in different membranes used.

In assaying liquid pepsins, the process is very easily carried out. One fluid ounce may be measured into each of six or eight vials, and different amounts of albumen placed in each, and the strength easily arrived at with very little trouble. I should be much pleased to have others try this process and report upon results. Since making the above observations, I have been led to try the method recommended by the British Pharmacopœia, of digesting at 130° F. for half an hour, instead of 100° to 104° for four to six hours. It seems to be a most remarkable way of testing, as the temperature is so far above that reached in the stomach. My results in each of two trials, carrying the period of digestion to 45 minutes instead of 30, are that as high results are not obtained by fully 10 per cent, and my experience has not encouraged me to recommend it.

As regards all pepsins, I am inclined to think the manufactures of the

United States far ahead of those of Europe as regards digestive strength.

These tests were all made in the laboratory of Eli Lilly & Co., Indianapolis.

NOTE ON STROPHANTHUS.

MUCH inquiry is at present made by members of the medical profession after a new cardiac drug, which is reported to possess the useful properties of digitalis without its disadvantages. This drug is the seed of a plant belonging to the natural order Apocynaceæ, viz., a species of Strophanthus.

The genus Strophanthus is distributed over a large area of tropical Asia and Africa, there being about eighteen different species known, one of them occurring also in extra-tropical southern Africa.

The general characters of the genus are as follows (according to Hooker):

Small trees or shrubs, often climbing. Leaves opposite. Flowers usually large, in terminal cymes. Calyx 5-partite, glandular within. Corolla funnel-shaped, tube short, throat large, campanulate, with 10 free or conuate scales; lobes overlapping to the right, produced into long or short tails, rarely ovate acute. Stamens, at the top of the tube, included, filaments short; anthers sagittate, tips filiform, conniving around and adhering to the stigma, cells spurred at the base. . . .

Follicles oblong or elongate, hard, spreading.

Seeds compressed, fusiform, narrowed into a feathery tail, or with a sessile coma, base with a deciduous tuft of hairs.

The particular species which yields the seeds that form the drug in question is supposed to be *Strophanthus hispidus* Bn., though it is possible that some other species, such as *Strophanthus Kombe* Ol., may furnish similar seeds.

These plants have been known for a number of years as the source of an arrow-poison, called by different names in different parts of Africa, viz., *Iné*, *Onayé*, *Inayé*, *Kombi* or *Kombé*, and *Kongkonie*.* (Some authors have *Onagé* instead of *Onayé*.) This arrow-poison seems to have been in vogue all over the tropical part of the African continent, though, perhaps, more generally in the western portion. It was used as an efficient aid in killing large and dangerous game.

In 1865, Pelikan first proved that this poison contained a powerful cardiac principle, upon which its fatal effects depended. His statements were confirmed by the investigations and reports of Dr. Fraser (in the "*Proc. of the Royal Soc. of Edinburgh*," 1869, and in the *Journ. of Anat. and Phys.*, 1872), Polaillon and Caville (in *Arch. de Physiol.*, 1872), and Valentine (in 1873).

Dr. Fraser, of Edinburgh, was the first to isolate from the arrow-poison a crystalline principle, named afterwards *strophanthin*, which belongs to the class of glucosides. Hardy* and Gallois, in 1877, erroneously supposed this to have been declared an alkaloid by Dr. Fraser.

The difficulty of obtaining a sufficient supply of the drug, and other circumstances, for some time interrupted Dr. Fraser's experiments. He succeeded, however, at length in procuring the original drug itself, namely, the follicle of Strophanthus, containing the seeds. In a paper read by him at last year's meeting of the British Medical Association, he says:

"The difficulty of procuring a sufficient supply of strophanthus—now overcome through the kindness of Mr. Buchanan—and other unavoidable circumstances interrupted for some years the investigation that had so far proceeded, and interrupted especially the application, which had early suggested itself to me, of this substance to the treatment of disease. The latter application has since been made, and, in the course of this communication, I shall bring before the Section a few of the therapeutic results I have obtained.

Follicles and seeds of *Strophanthus hispidus*.

"Before doing so, it may be interesting to the members of the Section were I to state some facts regarding the use of strophanthus as an arrow-poison, and regarding its chemistry and pharmacology.

"The plant belongs to the natural order of *Apocynaceæ*, and it is widely distributed throughout equatorial Africa. Oliver, De Candolle, and Baillon have described its botanical characters. It produces a follicle from nine to twelve inches in length, within which are contained from one to two hundred oval seeds, characterized by having beautiful comose appendices, that give an arrow-like appearance to the seeds.

"The seeds are very active, and, when coarsely ground and formed into a paste, they constitute the poison with which arrows are smeared. Poisoned arrows are used for procuring food, or for purposes of attack or self-defence by many tribes in Africa. They have been met with at Kombé, in the Manganya country, near the Zambesi, in the Shiré Valley in the Gaboon district, in Guinea, and in Senegambia. The poison is in some places called 'Kombé,' and in others 'Inée' or 'Onage.'

"When examining the chemical properties of the seeds, I early separated a crystalline body, having a strongly bitter taste, of a feebly acid reaction, readily soluble in water and in rectified spirit, and practically insoluble in ether, benzol, and petroleum spirit. [A crystalline specimen was exhibited.] This substance, which I have termed strophanthin, is not precipitated by the ordinary reagents for alkaloids; it does not contain introgen; and when it is heated with dilute sulphuric acid it yields glucose and a body insoluble in water, but very soluble in rectified spirit, and having a strongly bitter taste which may be termed strophanthidin. The crystalline body, strophanthin, is largely present in the seeds; its action is the same as that of the seeds themselves, and it can be separated in a comparatively pure form by a simple process. The essential part of the process consists of removing from a watery solution of the alcoholic extract a large quantity of fat and coloring matter, by agitating repeatedly with ether, and then evaporating the watery solution at a low temperature. Some further manipulations are required to separate a small quantity of impurity; but, even when they are not adopted, a crystalline and only slightly colored strophanthin may be obtained, which represents from 8 to 10 per cent of the seeds used.

"I have also found that strophanthin is present in the leaves and bark of the plant, but in smaller quantity than in the seeds.

"The pharmacological action of strophanthus appears to be an extremely simple one. It may, I believe, be described in a few words, that it is a muscle poison. However introduced into the body, it increases the contractile power of all striped muscles, and renders their contraction more complete and prolonged. In lethal doses it destroys, besides, the capacity of the muscle to assume the normal state of partial flaccidity, and causes the rigidity of contraction to become permanent, and to pass into the rigor of death. As the result of the action on muscle, the heart is early and powerfully affected. It receives a larger quantity in a given time than any of the other muscles of the body, and therefore it probably is that strophanthus affects its action more distinctly and powerfully than the action of the other striped muscles. Indeed, by regulating the dose, a very distinct pharmacological influence may be pro-

* Rochebrune et Arnaud, "Recherches chim. et tox.-physiol. sur le 'Onabaio,'" in: G. Revoil, "Faune et Flore des pays Comalis." Paris, 1882. (The onabaio is an arrow-poison derived from a terebinthaceous plant.)

* E. Hardy, "Rapport sur l'Inée (Strophanthus hispidus,)" in Bull. mens. de la Soc. d'Acclimatisation. Avril, 1877.—Hardy appears to have had a follicle under his observation, as he describes it quite correctly as being cylindrical, becoming thinner at both ends, with a thin and fragile wall. Compare also Gerrard in Pharm. Journ. [3], xi. (1881), 833.

duced upon the heart, while the other muscles remain apparently quite unaffected."

Through the kindness of Mr. H. N. Fraser, of 208 Fifth avenue, New York, we have had the opportunity of examining specimens of the drug. They consisted of a closed and an open follicle, the latter containing the winged seeds. They being the only specimens at that time in the country, we had to content ourselves with a superficial examination, but we caused a photograph to be taken of them, which accompanies this note.

The closed strophanthus follicle was 13 inches long. (According to Dr. Fraser, the ripe follicles vary between 9 and 12 inches.) It is not round, but somewhat flattened along its whole extent. Viewed from in front, the broadest portion is about 1 inch from the base, where it measures ¼ inch across. Viewed from the side, the broadest part is situated higher up, about 1¼ inches from the base, and here the diameter is $\frac{5}{16}$ inch. From either point the follicle tapers gradually towards both ends, ending in a fine point at the top. The follicle is slightly curved, the ventral suture being, as usual, on the convex side. The shell of the follicle is thin and fragile. Externally it is dull yellowish-brown, and finely-grooved lengthwise. The interior surface is shining, bright pale-yellow, or yellowish-brown.

The seeds contained within the follicle are comose—as shown in cut—the stalk of the tuft being about 2 inches long, while the hairs themselves have a length of 1½ to 2 inches.

The seeds are irregularly oval and flattened, of a glossy, brownish color, and of a velvety appearance, due to fine, appressed hairs. They are about 10 millimeters (⅜ inch) long, 4 Mm. broad across the centre, and, at the thickest portion, about 2 Mm. thick, tapering to 1 Mm. at either end. The base or radicle end of the seed is blunt; at the other end it tapers to a fine, slightly-curved point, from which the stalk of the coma arises. The surface of the seed is irregular, an elevated central ridge running from one end to the other.

The supplies of strophanthus at present available are scarce, as there is no regular export carried on as yet. Dr. Fraser, of Edinburgh, has succeeded in obtaining what are believed tolerably regular supplies. But only one other house, Messrs. Burroughs, Wellcome & Co., of London, has so far succeeded in securing an invoice of the drug. At present, it cannot be supplied in the crude state, but is sold in form of tincture, the dose of which is stated to be from 2 to 6 drops.

Lactate of Morphine.

A NOTE on this salt of morphine has recently been published by Mr. D. B. Dott.

When crystallized, it has the composition:

$$C_{17}H_{19}NO_3.C_3H_6O_3,$$

and is, therefore, anhydrous, being, in fact, the only salt of morphine so far known that will crystallize from water in an anhydrous condition.

Lactate of morphine is soluble in 8 parts of water, and in 93 parts of alcohol (sp. gr. 0.838 at 60° F.—*Pharm. Journ.*, May 15th.

Amyl Nitrite an Antidote to Cocaine.

DR. SHILLING reports in the *Medical Chronicle* that a female patient, to whom a solution of cocaine had been administered hypodermically, became suddenly unconscious. Suspecting that this was due to a contraction of the blood-vessels in the brain, he caused her to inhale the vapor of 3 drops of amyl nitrite, which restored her in a very short time.

[ORIGINAL COMMUNICATION.]

PHENYLHYDRAZIN AS A REAGENT FOR GLUCOSE.

WE have already in a previous issue mentioned the fact that a new reagent for glucose in the urine has recently been proposed; but we have awaited further information before giving details. These we can now supply to some extent, although we have not yet, ourselves, had more than a casual chance to experiment with the reagent.

In the first place it should be stated that all sugars having the composition $C_6H_{12}O_6$, and to a certain extent also those composed of $C_{12}H_{22}O_{11}$, may be regarded as closely allied either to the aldehydes or the ketones. Now there are certain reactions to which all aldehydes or ketones respond, both those which are regularly recognized as such, and also certain other bodies, the true relationship of which to aldehydes and ketones is not yet clearly understood, but is rendered more than probable by their behavior to these reagents, and other striking properties.

V. Meyer has found that *hydroxylamine* is a universal reagent for aldehydes and ketones, and Emil Fischer now recommends *phenylhydrazin* for the same purpose.

Phenylhydrazin may be regarded as ammonia NH_3, in which 1 at. of hydrogen is replaced by phenyl C_6H_5, and the other one by amidogen NH_2. It may be obtained by various processes, of which the following yields the best result:

Twenty parts of aniline ("oil") are dissolved in 50 parts of hydrochloric acid of spec. gr. 1.19 and 80 parts of water. This solution is mixed, while cold, with a calculated quantity (molecule for molecule) of sodium nitrite dissolved in twice its weight of water and acidulated with hydrochloric acid, whereby diazobenzolchloride is produced. This solution is at once poured into an ice-cold, saturated solution of sodium sulphite (2 mol. of Na_2SO_3 for every 1 mol. of aniline) and, as soon as a sample of the separated crystals, when warmed with some of the supernatant liquid, dissolves therein to a clear liquid without evolution of gas, the whole mixture is cautiously heated on the water-bath so that the separated salt is nearly all dissolved, and the solution carefully neutralized with hydrochloric acid. Finally, it is acidulated with acetic acid and the warm solution treated with zinc powder until it is decolorized. The solution is now filtered, heated to boiling (mixed with one-third its volume of fuming hydrochloric acid or as much as is necessary to combine with the phenylhydrazin), which causes the separation of hydrochlorate of phenylhydrazin. This is decomposed by soda, causing most of the phenylhydrazin to be precipitated as an oil, while the remainder is recovered by shaking the remaining solution with ether. The crude substance is dehydrated with potassium carbonate and rectified.

It forms an oil of a feebly aromatic odor, congealing when cooled to crystalline plates. It melts at 23° C. (73.4° F.), and boils at 233–234° C. (451°–453° F.), at 750 mm. It is a base, capable of combining with acids. It resists reducing agents very energetically, but is very easily destroyed by oxidizing agents. Fehling's solution is reduced even by highly dilute solutions of phenylhydrazin, nitrogen being given off, Cu_2O being precipitated, and aniline and benzol being formed.

When phenylhydrazin is brought in contact with aldehydes or ketones, they combine in even molecules to solid or oily condensation products, water being eliminated. In order that this reaction may be unfailing, it is necessary to have the reagent as pure as possible. It is best, therefore, to purify the commercial substance by separating the base from any acid present, heating it to drive out any free ammonia, dissolving it in 10 parts of alcohol, and then saturating it with concentrated hydrochloric acid. The crystalline mass is separated, washed with alcohol and ether until completely colorless and then dried on the water-bath.

The reaction with phenylhydrazin takes place best in a solution slightly acidulated with acetic acid. It is therefore preferable always to employ a freshly prepared solution containing

Hydrochlorate of Phenylhydrazin	1 part.
Acetate Sodium, cryst.	1½ parts.
Water	8 to 10 "

In the case of most ketones and aldehydes, the reaction may be performed in aqueous solution. In the case of insoluble, aromatic bodies, alcohol may be added. In most cases, the separation of the product of the reaction takes place already in the cold, in others (as in the case of glucose) heat is necessary.

The presence of free mineral acids prevents or retards the reaction. If they are present, they must be neutralized with soda. Nitrous acid is altogether inadmissible, and if present, must first be removed by means of urea.

The practical application of this reagent may be shown on the following examples.

1. *Oil of Bitter Almonds.* True oil of bitter almonds is an aldehyde, viz., benzaldehyde. See our May number, page 93. A solution of 1 part of this oil in 2,000 parts of water, when treated with the hydrochlorate of phenylhydrazin, yields at once a strong, white turbidity, which, on shaking, becomes a thick, flocculent, white precipitate. The reaction is still visible in a dilution of 1 to 50,000. The precipitate may easily be recrystallized from warm alcohol. The crystals melt at 152.5° C. (306° F.). [This test will distinguish the true oil of bitter almonds from nitrobenzol and other substitutes, and at the same time will serve as a means of separating them.]

2. *Acetophenone*, now commonly known as *hypnone* (see our April number, page 77). This, when suspended in water, and shaken with a solution of phenylhydrazin, quickly yields a yellowish, crystalline compound, which may be recrystallized from alcohol.

3. *Dextrose* (*Glucose*).—If 1 part of dextrose is heated with 2 parts of hydrochlorate of phenylhydrazin, 3 parts of sodium acetate, and 20 parts of water, on a water-bath, fine yellow needles will begin to separate after 10–15 minutes. These crystals are almost insoluble in water, but easily soluble in boiling alcohol. They have the composition $C_{18}H_{22}N_4O_4$, and are probably produced thus:

$$\underset{\text{glucose}}{C_6H_{12}O_6} + 2\underset{\text{phenylhydrazin}}{N_2H_3C_6H_5} = \underset{\text{[new compound]}}{C_{18}H_{22}N_4O_4} + \underset{\text{water}}{2H_2O} + \underset{\text{hydrogen}}{2H}$$

Yet Emil Fischer (who discovered this reaction, and from whose report, in *Ber. Deutsch Chem. Ges.* and *Zeit. f. anal. Chem.*, we take most of the present account) never could observe any escape of hydrogen, and therefore believes that there are some secondary reactions going on. He proposes for the new compound the name

PHENYL-GLUCOSAZONE,

until its nature can be studied and better understood.

As to the use of the reagent: *for detecting glucose in urine.*

This has been demonstrated by the experiments of Jaksch and Grocco

(*Zeitsch. f. anal. Chem.*, 1885, 478). When 50 C.c. of urine containing glucose are mixed with a solution of 2 Gm. of pure hydrochlorate of phenylhydrazin and 1.5 Gm. of sodium acetate in 20 C.c. of water, and the mixture heated on a water-bath, the abovementioned new compound, *phenylglucosazone*, will be separated after 10 to 15 minutes, in form of a yellow precipitate, appearing under the microscope as yellow needles, often grouped in stars. If the precipitate is amorphous, it may be easily crystallized from alcohol. According to Grocco, the above test succeeds yet in presence of only 0.01 Gm. of glucose in the liter (about ¼ grain per quart), and has this advantage over other reagents for glucose, that no other substance occurring in the urine produces any reaction with it.

4. Other sugars likewise respond to the reagent. For details regarding these we must refer the original (*Ber. d. Deutsch. Chem. Ges.*, 19, 579).

CENTRIFUGAL APPARATUS FOR LABORATORIES.

THE centrifuge here illustrated has been put on the market by C. Gerhardt, of Bonn, and is constructed after the pattern of the large centrifuges used in sugar factories. It weighs about 30 pounds, and occupies but little space, being 11¼ inches in diameter, and nearly 24 inches in height. Every portion which is liable to come into contact with the liquid to be separated is enamelled. Hence it is immaterial whether the liquid has an alkaline or an acid reaction.

The manner of operating the apparatus is intelligible from the cut.

An apparatus of this kind will be found of great service in many operations in the pharmaceutical and chemical laboratory.

Among many other uses to which it may be put, the following may be mentioned:

1. Drying of crystals, the moisture contained between them being ejected by the centrifugal motion.

2. Separating the liquid portion from moistened drugs, such as occur when making infusions, macerated tinctures, or separating the liquid portion from residues of percolation.

3. Filtration of syrups and other liquids, a suitable filtering cloth being laid upon the inside of the revolving drum.

Method of Obtaining Clear Filtrates with the Filter Pump.

IT is well known that certain substances, suspended in liquids, have the disagreeable tendency of passing through the pores of the filter until the latter has been somewhat clogged by them, or the substance has become slightly granular and cohesive. Instances of this kind are precipitated barium sulphate, carbonate of lead, certain sulphides, etc., etc.

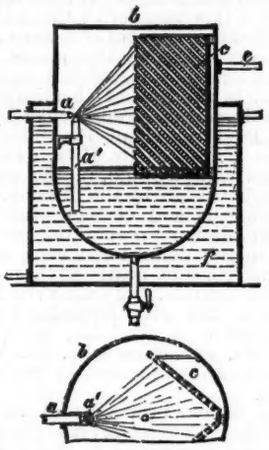
When a filter pump is used, the rate of exhaustion gradually increases in a constant ratio to the highest point attainable with the rate at which the water passes through the pump. And as long as there is *any* increase of exhaustion a clear liquid cannot be expected in these cases.

Dr. G. H. Bailey, of Manchester, has devised a plan to overcome this difficulty. In addition to the usual two perforations in the rubber cork, one of which is to hold the funnel, while the other leads to the pump, he provides a third, through which a tube passes, over the external end of which a piece of rubber tubing is slipped, and the latter closed with a stop-cock in such a manner that, when the rarefaction in the receiver reaches 200 millimeters, air can pass into the receiver, and can sustain the partial vacuum at 200 Mm.

The apparatus having been thus arranged, and the pump set going, the filtration may begin. Until the exhaustion has reached 200 Mm., the filtrate will run through cloudy. After it has been maintained a short time at 200 Mm., it will begin to run clear, and the muddy filtrate may then be removed and poured back again, so as to get the whole filtrate bright and free from suspended matter.

The stop-cock may be arranged so that air may be admitted at any other degree of rarefaction.—After *Annal. d. Chem.*, 232, 358.

Note.—The idea of thus arresting the exhaustion at a fixed point is very good, but the means adopted for obtaining it do not seem to us to be quite satisfactory, since it is certainly not an easy matter to adjust a pinch-cock so that it will slightly *open* when the outside pressure bears a certain relation to the inside pressure in the apparatus. There are many ways that suggest themselves as improvements. One of these, which we have tried, is quite simple. Make a series of fine pin-holes in the rubber tube attached to the glass-tube, and place the pinch-cock so that it will leave as many of the pin-holes to act as valves as may be found necessary to keep the exhaustion at the desired point.—ED. AM. DR.



Apparatus for distilling by spray.

Gerhardt's centrifuge.

Accident at Aniline Works.

THE substitution of hydrochloric for acetic acid in the manufacture of aniline has very nearly caused the death of five operatives in the works of Messrs. Durand & Huguenin, in Basle. It appears that this firm was in the habit of using in their works German hydrochloric acid, prepared with sulphuric acid from copper-pyrites, which always contains a large percentage of arsenic. During the process of aniline manufacture, the arsenic chloride contained in the hydrochloric acid became transformed into arseniuretted hydrogen, which the operatives inhaled.—*Chem. and Drugg.*

DISTILLATION OR EVAPORATION OF SPRAY.

ARMAND MUELLER, of New York, is the patentee of an apparatus for evaporating or distilling liquids by means of a spray or jet of air or steam.

Within the still or boiler is placed a perforated frame-work, made of wood or metal according as the nature of the liquid will admit. The shape of this frame in horizontal sections is shown in the smaller figure. The spray apparatus, *a a*, carries a current of compressed air, which may also be previously heated, if required. The products of the distillation are aspirated away through *e*. The boiler or chamber *b* may be heated by a water, sand, or oil bath.

The object of the frame is to deprive the spray as much as possible of particles of liquid mechanically carried over.

[ORIGINAL COMMUNICATION.]

A COMPARATIVE SURVEY OF THE PHARMACOPŒIAS OF EUROPE AND THE UNITED STATES.

DR. BRUNO HIRSCH, of Frankfurt-on-the-Main, has just favored us with the concluding number of the first volume of his latest work, already mentioned in previous issues of this Journal.*

The preface of this volume contains a summary of the results of the comparison of the leading pharmacopœias of the world. This summary, from the pen of so competent a critic on the field of pharmacopœial literature, has been written at a time when the salient features of each pharmacopœia must have been most vividly impressed on the mind of the writer, and it contains much from which the future revisers of the different pharmacopœias may derive benefit. We have thought it incumbent upon us to translate such portions as may be of more general interest.

The pharmacopœias which the author has made use of and collated in his work are the following:

[*Note.*—The language (or languages) in which each of these is composed is appended to each in parentheses.]

Austrian, VI.; 1869, Suppl., 1879. (Latin.)

Belgian, II. (III.); 1885. (Latin and French.)

British, II.; 1885. (English.)

Danish, II.; 1868, with Supplements, 1874 and 1876. (Latin; Suppl., Danish.)

Finnish, IV.; 1885. (Latin.)

French, IV.; 1884, with "Erratum." (French.)

German, II.; 1882. (Latin and German.)

Greek, I.; 1837, and Suppl., 1868. (Latin and Modern Greek.)

Hungarian, I.; 1871. (Latin and Hungarian.)

Netherlands, II.; 1871. (Latin.)

Norwegian, II.; 1870, Suppl., 1879. (Latin.)

Roumanian, II.; 1874. (Roumanian.)

Russian, III.; 1880. (Russian.)

Spanish, VI.; 1884. (Spanish.)

Swedish, VII.; 1879; Suppl., 1879. (Latin.)

Swiss, II.; 1872; Suppl., 1876. (Latin.)

United States, VI.; 1882. (English.)

[NOTE OF ED. AM. DR.—The Swedish Pharm. of 1879 is the third impression of the seventh edition, originally published in 1869. It is somewhat surprising to us that the author did not include the Portuguese Pharmacopœia of 1876, which is a very good one, and far superior, for instance, to the Spanish.]

Most of the pharmacopœias have adopted the Latin language for the

* "Universal-Pharmakopöe." Eine vergleichende Zusammenstellung der zur Zeit in Europa und Nordamerika gültigen Pharmakopöen. Von Dr. Bruno Hirsch. Vol. I., 8vo, Leipzig, pp. xvi. and 971.

official titles, though not all of them have adopted it for the text, as will be seen from the preceding table. The French, Spanish [Portuguese], and Roumanian are written in their respective vernaculars, and all of these, except the last, add the Latin titles as synonyms.

In the designation of the several drugs taken from the animal or vegetable kingdom, some of the pharmacopœias place the name of the *part* of the individual—viz., Cortex, Fructus, Herba, etc.—in front; for instance, the Belgian, Danish, Finnish, German, Swiss, Norwegian, Russian, and Swedish, which would say, therefore, *Cortex Cascarillæ*. Others transpose these names, as the British and Greek, which have *Cascarillæ Cortex*. The remainder use, as officinal titles, either the vulgar names or the systematic (scientific) names—for instance, *Absinthium* for *Artemisia Absinthium; Calamus* for *Acorus Calamus*—and either specify the particular part, which is intended to be used, in the definition or otherwise, or they omit to do so altogether.

In the titles of chemicals, some of the pharmacopœias place the electopositive constituent in front, while others reverse the order. For instance, hydrochloric acid is called *Acidum Hydrochloricum* by the Belgian, and, in their several vernaculars, by the French, Spanish, and Roumanian. The Danish, Norwegian, Russian, and Swedish call it *Acidum Hydrochloratum*, the others *Acidum Hydrochloricum*, except the Greek, which uses the old name *Acidum Muriaticum*. Green sulphate of iron is called *Ferri Sulphas* by the British and U. S. Ph.; *Sulphas Ferri* by the Belgian; *Sulphas ferrosus* by the Danish, Finnish, Netherlands, Norwegian, and Swedish; and correspondingly, in the vernacular, by the French and Spanish; *Ferrum sulphuricum* by all the others. The names of the *oxides* of aluminium, barium, calcium, etc., according to the old chemical nomenclature, appear in the titles of chemical salts in the French, Greek, Netherlands, Norwegian, Roumanian, Russian, and Swedish. In others the name of the metal itself is used. Many pharmacopœias designate certain commonly known substances, such as borax, alum, etc., by these very names, latinized, viz., *Borax, Alumen*, etc. Others again endeavor to express in the title the chemical composition, which sometimes leads to quite uncouth and impractical designations.

Almost all of the modern pharmacopœias arrange the titles of the officinal substances in *one* alphabetical order. Only the French, Greek, and Spanish separate the drugs and crude materials from the pharmaceutical and chemical preparations and compounds. While, however, the Greek and Spanish again enumerate the titles of the second part in one continuous alphabetical series, the French does this only in the first part (crude drugs), and subdivides the second part into three separate sections, respectively embracing chemical, galenical, and veterinary pharmacy; and the galenical is again subdivided into numerous sub-sections, each of them with a separate alphabetical arrangement, so that it is often difficult to find any title looked for, without consulting the index.

It is often said that a pharmacopœia should not be a text-book, that is, it should not attempt to teach. This principle is observed by some of the pharmacopœias quite rigidly, for instance, by the French, where the several titles of crude substances are merely enumerated, without any attempt at description or characterization. The same pharmacopœia, however, in its second part, decidedly infringes upon this principle in many instances. The same is often done by the Spanish, Belgian, and Russian, in the directions for making the various preparations. This infringement of the principle above mentioned, however, can do no harm, as long as the given directions are correct. The infringement may have arisen from a laudable desire, on the part of the compilers, to insure the identity of the products, even when prepared by the less skilled members of the profession.

A much more serious defect of a pharmacopœia is the presence of riddles, that is, of such directions or statements, or requirements, the reasons for which are not sufficiently well known outside of the body of revisers, and may not even be known to every one of the latter. Examples of this sort are the omission of the object of certain tests directed to ascertain the purity of a chemical. Several of the older pharmacopœias have already avoided this blunder by the addition of a chemical symbol or a word in parenthesis. Among the recent ones this is done most completely and uniformly in the case of chemicals and many important crude drugs by the U. S. Ph. ["excellent Pharmacopœia of the U. S.," as Dr. Hirsch here expresses himself], and, in the case of vegetable drugs, by the Russian.

Chemicals and certain other products of difficult preparation are, as a rule, merely defined and more or less characterized by nearly all the modern pharmacopœias. Only the French and Spanish still give formulas for the preparation of alkaloids, acids, ethereal oils, numerous salts, etc., which are but rarely prepared by the apothecary.

The largest proportion of working formulæ in the several pharmacopœias is, however, devoted to the so-called galenical preparations, as well as to certain chemicals which are apt to vary according to the process adopted. Here we meet the most remarkable discrepancies. It might be supposed that the green *sulphate of iron* could be prepared, all over the world, equally well by one and the same process. The fact, however, is that, of *sixteen* different pharmacopœias, each directs a different method. For preparing *Acetum Scillæ, sixteen* out of seventeen pharmacopœias prescribe different processes. Even the descriptions and tests of such simple products differ sometimes in the most surprising and unaccountable manner. On the other hand, in the case of substances which are more difficult to prepare, and require more knowledge and judgment to test, the methods are frequently almost literally identical, showing that in such cases the different pharmacopœias have derived their version from one and the same source [or have copied from each other], while in the former case each has acted upon its own judgment, not needing any guide to go by.

Nearly all modern pharmacopœias have adopted the decimal or metric system, or the system of parts by weight. The British alone, in spite of the meritorious example of the Pharm. of the U. S. [see note at end of article] still retains the mixed method, and directs that all solids be weighed and all liquids be measured. The attempt made in the last revision of the Brit. Ph. to adopt a modified system of parts by weight, by the introduction of "parts" and "fluid-parts," accomplishes the object but imperfectly. The Spanish Ph. has adopted a system of rounding off fractional numbers, which, in many cases, leads to very abnormal and variable results, particularly when the figures given by the pharmacopœia have to be multiplied to make larger quantities of product. On the other hand, some pharmacopœias are too punctilious in giving fractional, and inconvenient figures, where they were not needed.

A much more important feature—namely, the adjustment of certain groups of chemicals or solutions on the basis of their equivalents—has been, so far, only adopted by the Austrian, Hungarian, and Roumanian pharmacopœias, and even by these only in the case of the diluted acids. The author (Dr. Hirsch) has for many years advocated the adoption of a system in which the strength of the various diluted acids and the solutions of the caustic and carbonated alkalies, including ammonia, should be adjusted on the basis of their equivalents.

The normal properties of the chemical and pharmaceutical preparations are by no means treated with sufficient explicitness by all pharmacopœias. They, as well as the important reactions for identity, are often entirely absent.

A great advance has been made in the methods of testing the purity of preparations, particularly in the German and United States Pharms., by converting many qualitative into quantitative tests through the introduction of volumetric test-solutions. In contrast with these, it appears very strange that the new French Ph. does not contain a list of reagents, which none of the other pharmacopœias is without.

In comparing these different pharmacopœias, it is soon noticed that there is a sort of blood-relation between a certain number of them, which, in some cases, is even expressly acknowledged, or has been brought about intentionally. Very closely allied in every respect are the Austrian, Hungarian, and Roumanian. The Belgian, particularly in its last edition, shows many similarities to the French, while the older edition more nearly approached the Greek. The British and U. S. Phs. approach each other in many respects, and this is still more the case with the Danish, Norwegian, and Swedish, which were purposely composed in as uniform or similar a manner as possible. Nevertheless, the Norwegian has about 200 titles less than the Danish or Swedish, and the latter seems to have also paid some deference to the Russian. The last Finnish is closely related to the three Skandinavian Pharmacopœias, but still more so to the last German, from which it has often copied verbally, unfortunately without eliminating errors, even when such had been previously pointed out. The last French Ph. is in many respects not in advance of the previous edition of 1866, and has been probably but little influenced by other pharmacopœias.* It has retained a number of formulas which are certainly but rarely prepared in any dispensing establishment, and, on the other hand, has paid too little attention to the definition of the properties, and to the tests of purity of crude and manufactured articles. A large proportion of the tests which have been included is practically useless, and the text is full of errors, though most of them have been corrected in a supplement, entitled "Erratum." The new Spanish Pharm., which has evidently been somewhat influenced by the French, likewise stands comparatively isolated, in having a great number of preparations peculiar to itself. The Russian has much resemblance to the first German, but has evidently paid close attention to the criticisms and suggestions for improvement contained in the current literature.

While it is the duty of each nation having a pharmacopœia of its own to

* How little attention the French Pharmacopœia Committee has paid to other pharmacopœias which have appeared either previous to, or during the period of preparing the new edition, is evidenced, among other things, by the fact, that an official copy of the U. S. Ph. of 1882, sent to the French Commission, by vote of the Committee of Revision and Publication at the end of January, 1883, and accompanied by an official note signed by the presiding officers of the National Convention and the Committee of Revision, has to this day remained unacknowledged.

improve the latter at every new revision, none of them can afford to neglect the work accomplished by the others, but is bound to utilize for its own purposes whatever progress and advancement has been made by them. Among the large number of exisiting pharmacopœias there is *not one* which does not possess *some* points of merit over the others, either in general treatment of the subjects embraced, or in single articles. On the other hand, *none* of them is free from errors.

For this reason, each should be ready to accept knowledge from the other, so that every subsequent revision will make the work more perfect.

[NOTE BY ED. AM. DR.—Dr. Hirsch may not be aware that the signs of the times, in this country, point to the probability that the system of parts by weight, adopted in the last revision of the U. S. Ph., will again be abandoned in the next revision, at least in the preparation of tinctures, and liquids which are generally prescribed, as well as administered, by measure. The Committee of Revision of 1870 already had been directed to drop measures, but declined to do so, as the carrying out of the instructions would (as the Committee sums up its reasons; see U. S. Ph., 1870, p. xiv.) "entail so much expenditure of time, labor, and cost as to render the plan impracticable." The Committee was much censured for its failure to obey the instructions. The succeeding Committee of 1880 received the same directions from the Convention, and it *did* carry them out. For doing so, it has been probably as much blamed as the previous Committee had been for *not* doing. A permanent success of the plan to abandon measures entirely could be brought about only if physicians were to accustom themselves to prescribe liquids by weight. As this appears to be hopeless, to judge from previous experience, it will become an important question to decide, whether it will not be best to return to the former system. Possibly both may be combined. In such formulæ as the following:

Pulvis Cretæ Compositus.

Prepared chalk	30 parts.
Acacia, pd.	20 "
Sugar, pd.	50 "
	100 "

certainly no one will object to parts by weight. But in the case of a tincture, for instance, the physician wants to know at a glance, to how much of the crude drug a given volume of the preparation is equivalent. In the criticisms made upon the Committee of Revision, for its action in this matter, the fact of its having merely carried out its express instructions has often been left out of sight. The method of parts by weight was bound to be tried practically some time or other. If it never had been tried, there would always have been a great clamor for it. If after a thorough trial, it is declared by a respectable majority to be unsuited or impracticable for this country, it will be a simple matter to brush it away, and to substitute something better for it.]

Apone: a New Kind of Pain-Expeller.

THE following is said to be the mode of preparation of a sort of pain-killer recommended by Dr. Poulet under the name of *apone:*

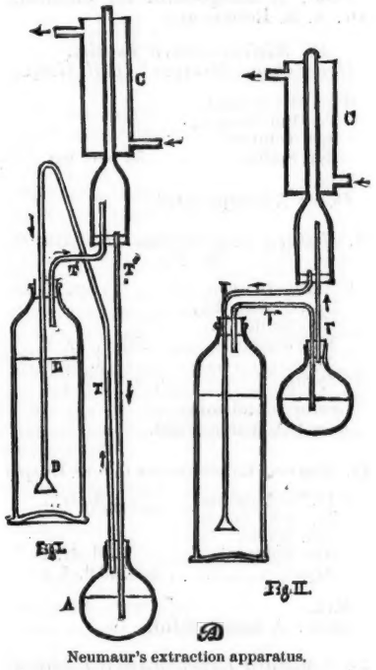
Capsicum	20 parts.
Water of Ammonia	10 "
Oil of Thyme	1 part.
Chloral	1 "
Alcohol, 60%	100 parts.

Digest the capsicum with the alcohol and ammonia during four weeks, filter, and add the other ingredients.—After *Pharm. Zeit.*

APPARATUS FOR EXTRACTING DISSOLVED SUBSTANCES FROM LIQUIDS BY MEANS OF LIGHT VOLATILE SOLVENTS.

APPARATUS for this purpose have been recently described by Neumaur (*Ber. d. Deutsch Gesell.*, xviii., 3,061; AMERICAN DRUGGIST, March number, 1886, p. 49). In this case a siphon was used to remove the solvent after it had passed through the liquid to be extracted, and I had myself been using an arrangement of somewhat similar principle. But in the course of work, the following simple method was found preferable:

The solvent in the flask A (Fig. 1) is heated by means of a water-bath, so that the vapor passes through the tube T to the bottom of the liquid to be treated with it (L), which is placed in the vessel B. As B is tightly corked, the condensed solvent, collecting above L, is next forced up the tube T′ (which opens above the surface of L) and into the open condenser C, from the bottom of which it is carried off by the tube T″ to return to A. The extra height of T above B checks regurgitation when A cools. It is evident that external heat



Neumaur's extraction apparatus.

may be applied to B to aid the extraction. If, on the other hand, it is necessary to avoid heating L by the condensation of the solvent, the arrangement shown in Fig. 2 is adopted. Here the vapor passes first to the condenser C by the tube T, and the condensed solvent collects in T′, which is of such a height that, by the weight of the column of liquid in that tube, a stream is forced through L and up T″, thus effecting the return to A. Some arrangement for spreading the solvent on its entrance to L will be found useful. For this a funnel (D) was fused to the tube T (Fig. 1), and over its mouth platinum pierced with pin-holes was folded.—ARNOLD EILOART, B.Sc., in *Chem. News*, 1886, 281.

An Elastic Mucilage.

THE *Chemische Centralblatt* gives the following directions for an elastic mucilage:

Dissolve 1 part of salicylic acid in 20 parts of alcohol, add 3 parts of soft soap and 3 parts of glycerin. Shake thoroughly, and add the mixture to a mucilage prepared from 93 parts of gum Arabic and the requisite amount of water (about 180 parts).

This mucilage is said to keep well, and, when it dries, to remain elastic without tendency to cracking.

Ozokerite Asphalt.

A NEW application of ozokerite has been recently discovered in Russia, where it is now used for making ties in the Transcaspian railroad, which has already passed Askabad, and nearly reached Merv. The process of manufacture is very simple and inexpensive. Kyra, the local name for ozokerite, is found there in thin layers of 7 inches in thickness. In its primitive state, it contains a certain percentage of decayed matter. To remove this, the ozokerite is melted in large caldrons, the refuse sinks to the bottom, and the pure ozokerite collects at the top. This purified ozokerite, melted and mixed with 75 per cent of limestone and 25 per cent of fine gravel, gives a very good asphalt, which is pressed in boxes shaped like railroad ties. Notwithstanding the high temperature, which reaches 48° R. (140° F.), the ties retain their shape and hardness.

These asphalt ties are used all along the road, except at the ends and centre of every rail, where, as yet, wooden ties are employed. In this way, about £160 per mile is economized.—*Chem. and Drugg.*

SELECTIONS FROM THE REVISED HOSPITAL FORMULARY

OF THE DEPARTMENT OF PUBLIC CHARITIES AND CORRECTION OF THE CITY OF NEW YORK.

THE Formulary of the Hospitals of the City of New York, under the charge of the Commissioners of Public Charities and Correction, has been out of print for several years. A new and revised edition has been prepared for distribution among the physicians and apothecaries of the department, and is shortly to be issued.* A large number of the preparations contained in the formulary have found their way into general practice, and inquiries for one or the other formula are constantly being directed to some one connected with the department. In order to comply with these requests, we shall publish a selection of the formulas, omitting those for which standard formulæ are available in other works of reference.

The titles by which the several preparations are known in the different institutions have been left unchanged, though some of them would lose their definiteness if used promiscuously or without reference to the source from which they have been taken. For instance, the very first formula, entitled "Cough Mixture," is that of a prepation in common use at the Out-door Dispensary of Bellevue Hospital. Outside of this particular institution, the title "Cough Mixture" might be applied to an infinite variety of compounds. For this reason, the name of the institution in which such preparations are in vogue should be regarded as an intrinsic part of the title.

A large proportion of the formulæ which will be given by us have been in use for years, and have survived numerous changes in the medical staffs of the institutions. Many of the formulæ have become favorite prescriptions of former internes, though they may be but rarely quoted by their hospital titles when they are prescribed in private practice.

The directions under each formula are purposely given in English, the Latin being restricted to the names of the ingredients. The *drachm* sign, which in many fonts of type is not sufficiently distinctive from the *ounce* sign, when quick reference is to be made to a formula, has been replaced

* The forthcoming edition is for use in the public institutions, and is *not* for sale. We mention this fact here to spare our readers the disappointment of finding this out themselves, after a deal of correspondence.

by the abbreviation *dr.* It would be well if this were generally adopted by the profession.

Hospital Formulary.

I. MIXTURES FOR INTERNAL USE.

A. FOR DISEASES OF THE RESPIRATORY ORGANS.

1. "*Cough Mixture*" (*Bureau O. D. P.*).*

℞ Syr. Tolutani,
Syr. Pruni Virg.,
Tr. Hyoscyami,
Spir. Æther. Comp.,
Aquæ..... ....āā p. æq.

Mix.

Dose: A teaspoonful. (Dr. E. G. Janeway.)

2. "*Cough Mixture for Adults*" (*Inf. Hosp.*).

℞ Ammon. Chloridi.....dr. 1
Spir. Æther. Comp.....fl. dr. 6
Syr. Pruni Virg..... .. fl. ℥ 2
Aquæ..... ...q. s. ad fl. ℥ 4

Dissolve and mix.
Dose: A teaspoonful.

3. "*Cough Mixture for Infants*" (*Inf. Hosp.*).

℞ Tr. Opii Camph.,
Spir. Ammon. Arom.,
Syr. Pruni Virg.....āā fl. ℥ 1
Ext. Ipecac. Fl..... ..♏ 30
Aquæ.....q. s. ad fl. ℥ 8

Mix.
Dose: A teaspoonful.

4. *Emulsio Expectorans* (*Hart's Isl. Hosp.*).

℞ Morphinæ Sulph.....gr. 1
Syr. Scillæ.,
Syr. Ipecac..... ... āā fl. ℥ 1
Syr. Tolutani.,
Syr. Pruni Virg.....āā fl. dr. 6
Tr. Benzoin. Comp.,
Tr. Sanguinariæ.....āā fl. dr. 2

Dissolve and mix.
Dose: A teaspoonful.

5. *Mistura Ammonii Carbonatis* (*Bureau O. D. P.*).

℞ Ammonii Carbonat.,
Ext. Glycyrrhizæ.....āā gr. 30
Syr. Senegæ.....fl. dr. 4
Syr. Ipecac .....fl. dr. 2
Syr. Tolutani.....fl. dr. 4
Aquæ Cinnam. ....q. s. ad fl. ℥ 4

Dissolve and mix.
Dose: A teaspoonful, for children. (Dr. G. H. Bosley.)

6. *Mistura Antasthmatica* (*Bureau O. D. P.*). ("*Asthma Mixture.*")

℞ Codeinæ Sulphatis.....gr. 4
Potassii Iodidi.. .....gr. 32
Chloroformi.....♏ 0
Syrupi.....fl. ℥ 1
Mucilag. Acaciæ....q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful. (Dr. S. S. Burt.)

7. *Mistura Asthmatica* (*Bell. and Char. Hosp.*).

℞ Morphinæ Sulph.... .....gr. 1
Aquæ,
Spir. Ætheris Comp... āā fl. ℥ 1
Dissolve and mix.
Dose: A teaspoonful.
Note.—In the public hospitals, the so-called United States solution of morphine (1 grain in 1 fluidounce) is still very generally used. As it is no longer officinal, it has been thought advisable not to direct it as a constituent of a mixture or compound, but to specify the quantity of morphine and water, separately.

8. *Mistura Bechica.*
"*Cough Mixture (Steurer)*" (*Bureau O. D. P.*).

℞ Tr. Opii Camph.,
Tr. Hyoscyami,
Syr. Pruni Virg.,
Syr. Tolutani..... āā part æq.

Mix.
Dose: A tablespoonful. (Dr. J. A. Steurer.)

9. *Mistura Bronchi* (*Bureau O. D. P.*).

℞ Ammonii Carb .....gr. 10
Syr. Pruni Virg.....♏ 30
Syr. Ipecac.....fl. dr. 1½
Tr. Opii Camph..... ... .fl. dr. 1
Aquæ.....q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful for children. (Dr. A. R. Robinson.)

10. *Mistura contra Tussim.*
"*House Cough Mixture*" (*Bell. Hosp.*).

℞ Tr. Hyoscyami,
Tr. Opii Camph.,
Spr. Tolutani,
Syr. Scillæ.....āā part æq.

Mix.
Dose: A teaspoonful.

11. *Mistura Expectorans* (*Bureau O. D. P.*).

℞ Ammonii Carb.... ... .gr. 16
Ext. Senegæ Fl.,
Ext. Scillæ Fl.,
Tr. Tolutanæ .....āā fl. dr. 2
Aquæ.....fl. dr. 4
Syrupi.....q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.

12. *Mistura Expectorans* (*Char. Hosp.*)

℞ Tr. Sanguinariæ.....fl. dr. 1
Tr. Opii Camph.,
Syr. Scillæ,
Syr. Tolutani.....āā fl. dr. 2
Aquæ.....q. s. ad fl. ℥ 2

Mix.
Dose: A teaspoonful.

13. "*Mistura Expectorans (Children)*" (*Bureau O. D. P.*).

℞ Syr. Senegæ,
Syr. Pruni Virg.,
Syr. Acaciæ.....āā part æq.

Mix.
Dose: A teaspoonful. (Dr. Th. H. Holgate.)

14. *Mistura Expectorans* (*Stokes*). *Stokes' Expectorant.*

℞ Ammonii Carb..... gr. 32.
Ext. Scillæ Fl.,
Ext. Senegæ..... ...āā fl. dr. 1
Tr. Opii Camph.....fl. dr. 6
Aquæ.....fl. dr. 4
Syr. Tolutani.....q. s. ad fl. ℥ 4

Dissolve and mix.
Dose: A teaspoonful.

15. *Mistura Expectorans* ("*Struma*") (*Bureau O. D. P.*).

℞ Amınonii Chloridi.... ....gr. 45
Syr. Ferri Iodidi..... ....♏ 45
Syr. Senegæ,
Syr. Pruni Virg.,
Syr. Acaciæ.....āā fl. ℥ 1
Olei Morrhuæ.. .....fl. ℥ 3

Dissolve and mix.
Dose: One and one-half teaspoonfuls every three hours, to a child of four years. In bronchitis with struma. (Dr. Th. H. Holgate.)

16. *Mistura Glonoini.*
(*Mistura Nitroglycerini.*)

℞ Spiritus Glonoini (1%) .....gtt. 1
Syrupi..... .....fl. ℥ ½

Mix.
One dose, to be taken every 4 hours in angina pectoris, asthma, etc.
Note.—Spiritus Glonoini is a 1-per-cent alcoholic solution of nitroglycerin.

17. *Mistura Glycyrrhizæ* (*Bureau O. D. P.*).

℞ Ammonii Chloridi,
Ext. Glycyrrhizæ pulv....āā dr. 2
Tr. Opii Camph.....fl. dr. 2
Aquæ.....q. s. ad fl. ℥ 4

Mix.
Dose: A teaspoonful. (Dr. D. Brekes.)

18. *Mistura Glycyrrhizæ Composita* (*Bureau O. D. P.*).
(*Brown Mixture, modified.*)

℞ Ext. Glycyrrhizæ Fl.....fl. dr. 2
Vini Antimonii.....fl. dr. 2
Spir. Æther. Nitr.....fl. dr. 1
Tr. Opii Camph.,
Syrupi .....āā fl. dr. 4
Aquæ.....q. s. ad fl. ℥ 4

Mix.
Dose: 1 to 4 teaspoonfuls.

19. *Mistura Hydrocyanica* (*Bell. Hosp.*).

℞ Acidi Hydrocyanici dil... ..♏ 32
Morphinæ Sulphatis.....gr. 1
Syrupi Tolutani.....fl. ℥ 1
Aquæ .....q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.
Note.—This mixture was formerly directed to be made with cyanide of potassium, instead of with hydrocyanic acid. But as this salt always contains more or less carbonate of potassium, it is incompatible with salts of alkaloids, as it precipitates the latter, and the whole of the precipitated alkaloid may accidentally be taken with the last dose.

20. *Mistura Hydrocyanica* (*Char. Hosp.*).

℞ Potassii Cyanidi.....gr. 2
Vini Antimonii.....fl. dr. 2
Syr. Tolutani,
Mucilag. Acaciæ.....āā fl. dr. 4
Aquæ.....q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.

21. *Mistura Hyoscyami Composita.*

℞ Acidi Hydrocyanici dil.,
Chloroformi.....āā ♏ 30
Tr. Hyoscyami,
Aquæ Camphoræ.....āā fl. ℥ 1

Mix.
Dose: A teaspoonful.

22. *Mistura Pectoralis* (*Gouv. Hosp.*).

℞ Antimon. et Potass. Tart.,
Morphinæ Sulphatis....āā gr. ¼
Ext. Cubebæ Fl ... .♏ 16
Syr. Tolutani. .....fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful. (Dr. C. F. Stokes.)

23. *Mistura Pertussis* (*Bureau O. D. P.*).

℞ Potassii Bromidi ....gr. 8
Tr. Opii Camph.,
Syr. Ipecac.,
Syr. Lactucarii,
Syr. Tolutani.....āā fl. dr. 2
Aquæ.....q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.

24. "*Mistura Pertussis (Children)*" (*Bureau O. D. P.*).

℞ Ammonii Bromidi,
Ferri et Quininæ Cit.....āā dr. 1½
Syr. Senegæ.,
Syr. Pruni Virg.,
Syr. Acaciæ.....āā fl. ℥ 1

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* Where no special institution is quoted by name, it is understood that the preparation or compound is used in several or in all institutions. The abbreviated names stand for the following:
Bell. Hosp.=Bellevue Hospital, New York City.
Char. Hosp.=Charity Hospital, Blackwell's Island.
Bureau O. D. P.=Bureau of Medical and Surgical Relief for the Out-Door Poor (Bellevue Dispensary).
Gouv. Hosp =Gouverneur Hospital.
Hart's Isl. H.=Hart's Island Hospital.
Inf. Hosp.=Infant's Hospital, Randall's Island.
Rand. Isl. H.=Randall's Island Hospital.
Ins. As.=Insane Asylum, Ward's Island.
Lun. As.=Lunatic Asylum, Ward's Island.
99th St. Hosp.=Ninety-Ninth Street Reception Hospital.
West. Disp.=Bureau Med. and Surg. Relief for the Out-Door Poor of the 23d and 24th Wards (Westchester Ave.).

Dissolve and mix.
Dose: A teaspoonful for a child of four years. (Dr. Th. H. Holgate.)

25. *Mistura Potassii Bromo-Cyanidi (Bureau O. D. P.).*

℞ Potassii Bromidi.....dr. 4
Potassii Cyanidi.....gr. 4
Syr. Pruni Virg.....fl. ℥ 4

Dissolve and mix.
Dose: A teaspoonful.

26. *Mistura Potassii Chloratis (Bureau O. D. P.).*

℞ Potassii Chloratis,
Ammonii Chloridi..... āā dr. 1
Ext. Glycyrrhizæ Fl.....fl. dr. 2
Aquæ.....q. s. ad fl. ℥ 4

Dissolve and mix.
Dose: A teaspoonful. (Dr. G. G. Wheelock.)

27. *Mistura Potassii Iodidi et Hoffmanni (Bureau O. D. P.).*

℞ Potassii Iodidi .....dr. 3
Tr. Tolutanæ,
Ext. Pruni Virg. Fl ...āā fl. dr. 1
Syrupi,
Aquæ.....āā fl. ℥ 1
Spir. Æther. Comp.....fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful. (Dr. E. G. Janeway.)

28. *Mistura Potassii Iodidi et Hoffmanni Composita (Bureau O. D. P.).*

℞ Ammonii Carbonat .....gr. 50
Potassii Iodidi .....dr. 3
Syr. Pruni Virg.,
Spir. Æther. Comp....āā fl. ℥ 1½

Dissolve and mix.
Dose: A teaspoonful. (Dr. W. H. Katzenbach.)

29. *Mistura Potassii Nitratis (Bureau O. D. P.).*

℞ Potassii Nitratis.....gr. 1
Spir. Æther. Nitr.,
Syr. Ipecac..... āā ♏ 30
Syr. Pruni Virg.....fl. dr. 2
Aquæ .....q.s. ad fl. ℥ 1

Dissolve and mix.
Dose: A teaspoonful for children. (Dr. A. R. Robinson.)

30. *Mistura Sedativa (Bureau O. D. P.).*

℞ Acidi Hydrocyanici dil.,
Chloroformi Purificati....āā ♏ 30
Tr. Hyoscyami,
Syr. Tolutani,
Aquæ Camphoræ,
Mucilag. Acaciæ.....āā fl. dr. 4

Mix.
Dose: A teaspoonful. (Dr. W. H. Katzenbach.)

31. *Mistura Tolutana Acida.*

℞ Tr. Tolutanæ.....fl. dr. 2
Acidi Acetici.....fl. dr. 1½
Syr. Senegæ.....fl. dr. 4
Syr. Pruni Virg .....fl. ℥ 2

Mix.
Dose: A teaspoonful.

32. *Mistura "Tussis" (Bureau O. D. P.).*

℞ Tr. Nucis Vomicæ.....fl. dr. 2
Vin. Ipecac.....fl. dr. 2½
Syr. Sarsaparillæ Co.,
Syr. Senegæ.....āā fl. ℥ 1½

Mix.
Dose: A teaspoonful, for children. (Dr. W. F. Ackermann.)

33. *"Night-Sweat Mixture" (Bureau O. D. P.).*

℞ Atropinæ Sulphat .....gr. $\frac{1}{100}$
Strychninæ Sulphat.....gr. $\frac{1}{60}$
Syrupi.....♏ 30
Aquæ.....fl. dr. 2

Dissolve and mix.
One dose. (Dr. S. S. Burt.)

34. *Whooping Cough Mixture (Inf. Hosp.).*

℞ Acidi Nitrici dil.....fl. dr. 1
Syr. Pruni Virg.....fl. dr. 4
Aquæ.....q. s. ad fl. ℥ 2

Mix.
Dose: A teaspoonful.

B. TONIC MIXTURES.

35. *Lemon Tonic (Char. Hosp.).*

℞ Cinchoninæ Sulphat.,
Acidi Citrici.....āā gr. 30
Syrupi.....fl. ℥ 1½
Tr. Ferri Chloridi.....♏ 30
Aquæ.....q. s. ad fl. ℥ 4

Dissolve and mix.
Dose: A teaspoonful.

36. *Mistura Acidi Muriatici (Bureau O. D. P.).*

℞ Acidi Hydrochlorici.....♏ 45
Tr. Gentian. Comp.,
Aquæ.....āā fl. ℥ 2

Mix.
Dose: A teaspoonful.

37. *Mistura Ferri et Ammonii Citratis (Bureau O. D. P.).*

Ferri et Ammon. Citr.,
Ammonii Carbonat.....āā gr. 32
Syrupi,
℞ Aquæ Anisi.....āā fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful. (Dr. J. L. Smith.)

38. *Mistura Ferri et Bismuthi (Bureau O. D. P.).*

℞ Ferri et Bismuthi Citr.....gr. 60
Aquæ.....fl. ℥ 1

Dissolve and mix.
Dose: A teaspoonful. In dyspepsia, gastric intolerance of consumptives, etc.

Note.—Citrate of Iron and Bismuth is a compound containing equal parts, by weight, of citrate of iron and ammonium and citrate of bismuth and ammonium.

39. *Mistura Ferri et Cinchoninæ (I.) (Bureau O. D. P.).*

℞ Cinchoninæ Sulphatis. ...gr. 60
Tr. Ferri Chloridi.....fl. dr. 2
Aquæ.....q. s. ad fl. ℥ 4

Dissolve and mix.
Dose: A teaspoonful.

40. *Mistura Ferri et Cinchoninæ (II.) (Char. Hosp.).*

℞ Cinchoninæ Sulphatis.....gr. 60
Tr. Ferri. Chloridi.....fl. dr. 2
Aquæ.....fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.

41. *Mistura Ferri et Lactis.*

℞ Syrupi.....fl. dr. 2
Lactis Recentis.....fl. ℥ 2
Tr. Ferri Chloridi...dosim unam.

To the mixture of Syrup and Fresh Milk, freshly prepared for the purpose, add the prescribed dose of Tincture of Iron, mix quickly, and administer it. The taste of the iron is completely covered by the vehicle.

42. *Mistura Ferri et Quininæ.*

℞ Quininæ Sulphatis.....gr. 30
Tr. Ferri Chloridi.....fl. dr. 2
Aquæ.....q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.

43. *Mistura Iodata (Bureau O. D. P.).*

℞ Potassii Iodidi.....dr. 2.
Syr. Ferri Iodidi.....fl. dr. 4
Tr. Calumbæ.....q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.

44. *Mistura Nigra (Bureau O. D. P.).*

℞ Ferri et Ammon. Citr.....gr. 30
Tr. Cinchonæ Comp.....fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.

45. *Mistura pro Anæmia (Bureau O. D. P.).*

℞ Ammonii Chloridi..... dr. 2
Tr. Ferri Chloridi.....fl. dr. 3
Glycerini.....fl. ℥ 1
Aquæ.....q. s. ad fl. ℥ 3

Dissolve and mix.
Dose: A teaspoonful. (Dr. W. H. Katzenbach.)

46. *Mistura Quininæ Dulcis.*

℞ Quininæ Sulphatis,
Glycyrrhizini Ammoniati (U. S. Ph.)..... .....āā gr. 15
Elixir Aromatici..... .....fl. ℥ 1

Dissolve the Ammoniated Glycyrrhizin in the Aromatic Elixir, and suspend in it the Sulphate of Quinine, using no acid, as this would precipitate the glycyrrhizin.

Inoculation Against Yellow Fever.

RECENT reports appear to confirm the claim made by Dr. Domingo Freire, Professor of Physiology at the Medical College of Rio de Janeiro, that he has succeeded in discovering the microbe of yellow fever, and is enabled, by suitable inoculation of the healthy subject, to protect the latter against attack by this dread disease. Some time during the year 1880, he observed numerous microbes in the blood of persons who had died of yellow fever. These microbes were in various stages of development, and were enveloped by a dark-colored cellular substance, which Dr. Freire regards as the true poisonous principle of the disease. During November, 1883, he inoculated himself, as well as several colleagues, with this substance, and induced some four hundred other persons, during the next few months, to undergo inoculation at his hands. According to his statement, the inoculation is followed by symptoms resembling that of a mild type of the fever: pain in the eyeball, headache, loss of appetite, and general lassitude. After two or three days, complete recovery. A few hours after inoculation, the blood will be found to contain the above-mentioned microbes, but these are enveloped in a much thinner cellular tissue, which soon shrivels up and disappears.

So far as the results reported seem to show, the immunity against attacks of yellow fever, among those who have been inoculated, is quite remarkable, only a very small percentage having been attacked. It is too soon to declare the success of the method as fully confirmed, but there is every hope that the terrible scourge, which has often devastated large districts of this country, may be brought under sanitary control.

Iodism Cured by Sulphanilic Acid.

THE extremely depressing effect and severe catarrhal symptoms occasionally produced by the administration of iodides, and known as iodism, has been explained by Ehrlich as due to the fact that nitrates in the presence of weak acids set free the iodine, and on this theory he has experimented with sulphanilic acid as a remedy for the symptoms produced. This substance, having a powerful affinity for nitric acid, possibly prevents this reaction, since, when given in doses of 4, 5, or 6 grains, in half the cases the iodism vanished as if by magic. As much as 7 grains has been given. To render it soluble, one part of bicarbonate of sodium is added to the water used for each 1½ parts of sulphanilic acid.—*Med. Chron.*, p. 135; and *Pharm. Journ.*

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EDITORIAL.

THE circular of the Committee on National Formulary of the American Pharmaceutical Association, published elsewhere on this page, draws attention to the necessity of forwarding to it, as soon as possible, any contributions which it is intended should be incorporated in its report. The committee, which consists of five members, has had the assistance of the three pharmaceutical societies of New York and Brooklyn, and has held meetings almost every week since October of last year. It has made a large number of experiments and is entitled to say that it has accepted nothing without proper investigation and study. While the committee has been supported and encouraged by the offer of assistance, or actual contributions, from various associations and persons, it has encountered a serious, but not unexpected, difficulty in trying to harmonize antagonistic formulas and processes. That such differences would occur was, of course, well known. In fact, it was the very existence of these differences which called into life the predecessor of the National Committee, and which culminated in the production of the New York and Brooklyn Formulary. The National Committee, realizing that a violent equalization of discordant formulas—particularly at the very outset of the undertaking—would jeopardize the success of the latter, has endeavored to make such selections as are believed will be acceptable to a majority of the members of the profession, subject, of course, to further revision and improvement. In doing this, it became necessary, in several instances, when widely different formulas were submitted for one and the same preparation, to select one and to exclude all others. Whether the Committee has chosen the proper one, is a question which the experience of the future will decide. But it may be confidently expected that every selection, and indeed every action of the Committee has been made in good faith, with a single eye to the object to be accomplished.

The National Formulary does not partake of the dignity and importance of a pharmacopœia. While in the composition of the latter work it is expected that the practical knowledge of the revisers shall be rigidly controlled and kept in check by considerations of science, ethics, and law, the restrictions which may be placed around the Formulary are much more loose and, at the present time, hardly definable. The formulary may perhaps be defined as "the standard and recognized guide for the preparation of such compounds as are not officinal in our pharmacopœia, but which are above the level of mere trade-receipts, or are of a trivial or improper character." Accordingly, the Formulary may contain:

1. Such articles and compounds as have once been officinal (or official), but which have been discarded, though still in use.

2. Such as have not yet been incorporated into the pharmacopœia, either because they have only been introduced since the last revision, or because they may have appeared to the several former Committees of Revision as not of sufficient merit or importance to be recognized.

3. Such as are officinal in other pharmacopœias, and are used to some extent in this country.

Regarding the latter, it might be urged that every pharmacist ought to be in possession of the necessary works of reference to enable him to find the formulas desired. This argument may, however, be simply turned around by saying: Incorporate them in the Formulary, and he will have the work of reference.

The National Committee, in fact, has incorporated, in their new list, a small number of preparations taken from foreign pharmacopœias; but it has, for the present, only selected those which are of the most frequent occurrence, and it will, moreover, present them in a form acceptable to the American pharmacist. Subsequent Committees may add others or eliminate some of those now incorporated, if found necessary.

There is one feature connected with National Formulary that is of considerable importance, and has not as yet been pointed out. It is this, that the Formulary will be able to serve as the "pension office" for such officinal preparations as may, at a new revision, be discarded from the work. Every Committee of Revision, since perhaps 1840, has been criticised for leaving in the Pharmacopœia, or introducing therein, a large number of preparations having the same ultimate therapeutic object—for instance, more than 20 different salts or compounds of iron. Their invariable excuse has been that some of these compounds were still used, though perhaps to a slight extent only, in some sections of the country, and the Committees felt compelled to provide formulas for them in order to insure their uniformity. Should the next Committee of Revision understand that the American Pharm. Assoc. would provide a retiring place for such preparations, by which their continued uniformity could be assured until such time as they may cease to be used or perhaps again require official recognition, the list of official titles in the Pharmacopœia could be greatly reduced.

While it is not our intention to anticipate any of the report or recommendations of the National Committee, to be made at the next meeting, there is one point to which we now wish to draw attention, as it is likewise of some importance. It may not be generally known that the method by which the Committee has accomplished most of its work is by means of circulars containing copies of the formulas under discussion, which are sent to every member for study and examination. It would have involved too much labor to repeat the issue of every circular, so as to embody the alterations and corrections made at each meeting. After the chairman has prepared the final manuscript copy, there will be no other chance for the members to examine the formulas singly and critically, unless the Association should come to their aid. That is, the Committee which drew up the report ought to have the opportunity of reading the proofs, with power to make such alterations and corrections as may be found necessary, and to see their work through the press. It is only when each member has a chance of calmly reading the proofs, and comparing one formula with another already printed, that he will be able to give an intelligent verdict. The privilege of thus seeing their own report through the press ought to be accorded to this and to every succeeding Committee on National Formulary, and arrangements for printing this report should be made immediately after the annual meeting, so that the report may be in the hands of the new Committee as soon as possible. The report ought to be printed in the same size and style as the Proceedings, and the pages should be electrotyped, both for furnishing pamphlet reprints, if such are required, as well as for incorporation in the Proceedings.

American Pharmaceutical Association.

COMMITTEE ON NATIONAL FORMULARY.

THE Committee on National Formulary of the A. P. A., appointed at the last meeting held at Pittsburg, has arrived at a point in its work when it becomes desirable that all contributions, intended for its use by pharmaceutical associations or by individuals, should be placed in its hands, in order to be incorporated in the report to be presented at the next meeting. The Committee desires here to tender its acknowledgments and thanks for the support and assistance it has received from many quarters, and it hopes to become the recipient of still further aid before it closes its labors. Any contributions which can reach the undersigned before August 15th will be included in the final report.

Respectfully,

CHARLES RICE,
Chairman of Committee.

Cocaine Aided by Electricity to Act as a Local Anæsthetic.

IT is well known that the simple application of a cocaine solution upon the sound skin has no anæsthetic effect. This may, however, be brought about, according to Dr. Wagner, of Vienna, by combining an electric current with the cocaine. It is known that the electric current has the property of causing the forward movement of fluids which are contained in capillary tubes—this is called the cataphoric force or effect of the electric current. If the electrodes of a battery are moistened with a solution of cocaine, it has been found that the latter is propelled into the cellular tissue, causing the skin to become anæsthetic within a few minutes, so that it may be punctured with needles or cut with knives without causing any sensation or feeling of pain. Any desired amount of skin surface may in this manner be made anæsthetic. The anæsthesia lasts ten to fifteen minutes, but may be prolonged by applying an Esmarch bandage previous to the application of cocaine.—*Pharm. Post.*

NOTES ON PRACTICAL PHARMACY.*

(Continued from p. 129.)

DRUGS WHICH UNDERGO DECOMPOSITION WHEN MIXED WITH OTHERS (INCOMPATIBLE SUBSTANCES).

[THE list given by Hager might be extended almost indefinitely. It is, however, impracticable to provide for all possible emergencies; and, as the actual occurrences at the prescription counter have been kept in view by the author, rather than theoretical possibilities, we have altered the original draft but little.—ED. AMER. DRUG.]

Mention will here be made only of those drugs in most common use which, when mixed with certain other drugs, are either decomposed or suffer some change by reason of which their intended effect is either destroyed, lessened or increased, or which yield mixtures which a physician slightly skilled in the art of compounding might suppose were conformable to rule, or which would be productive of danger to the patient. It is nevertheless true that usage sanctions some mixtures of incompatible substances, which may be intentionally prescribed by the physician. These are marked in the following list with an asterisk (*).

Acida (*Acids in general*)—Alkalies, alkaline liquids, acetates, metallic oxides.

Acidum arseniosum — Lime-water, oxide of iron, magnesia.

Acidum salicylicum — Salts of iron, iodide of potassium, lime-water.

Acidum tannicum (tannin, substances containing tannin)—Gummy substances, all of the metallic salts, lime-water, carbonates of alkalies, bicarbonates of alkalies, albumen of egg, gelatin, chlorine water.

Albumen (white of egg)—Acids, alcohol, substances containing tannin, corrosive sublimate.

Alkaloid salts in general—Substances containing tannin, tannin (*), carbonates of alkalies, and alkaline earths, iodine, compounds of iodine, licorice (*), concentrated mucilages (carragheen, salep), tinctura rhei aquosa, tinctura scillæ kalina, tinctura guaiaci ammoniata.

Aluminii sulphas—Alkalies, alkali carbonates.

Ammonii bromidum—Mineral acids, alkali carbonates, chlorine, chloride of potassium, bichromate of potassium, nitrate of silver, nitrate of mercury, calomel.

Ammonii chloridum, Ammonii phosphas—Carbonates of fixed alkalies and alkaline earths.

Amyl nitris—Alcohol, tinctures, carbonates of alkalies, calomel, salts of lead, ferrous salts (protosalts of iron), iodide of potassium.

Apomorphine (hydrochlorate)—Carbonate of sodium, bicarbonate of sodium, oxides of iron, salts of iron, iodine, substances containing tannin.

Argenti nitras, Nitrate of silver—Hydrochloric acid, sulphuric acid, acetic acid, tartaric acid, or salts of these acids; also prussic acid, aqua amygdalarum amarum, aqua laurocerasi, iodine, iodide of potassium, bromide of potassium, carbonates of alkalies and alkaline earths, sulphide of antimony, sulphur.

Barii chloridum — Sulphuric acid, phosphoric acid, salts of these acids, salts of carbonic acid, medicinal wines, infusions of plants.

Bismuthi subnitras—Substances containing tannin, sulphur, sulphide of antimony, calomel, calx chlorata, chloride of lime, organic substances, especially ethereal oils, substances containing tannin, sulphur, or sulphides.

Calx, Liquor calcis—Acids, carbonates, salts of ammonium, metallic salts, tartrates, infusions of plants, tinctures, substances containing tannin.

Calcii chloridum—Sulphates, phosphates, tartrates, and carbonates, calomel.

Chloral hydras—Water (*slow decomposition) warm water, carbonates of alkalies, salts of alkalies, with vegetable acids, salts of ammonium, nitrate of mercury, calomel.

Chlorum, Aqua chlori—Alkalies, carbonates of alkalies, salts of ammonium, salts of vegetable acids, nitrate of silver, salts of lead, substances containing tannin, gums, vegetable extracts, tinctures, vegetable decoctions and infusions, syrups made of infusions of plants, milk, emulsions, etc. (The odor and taste of chlorine disappear at once or in a short time.)

Digitalis—Substances containing tannin, acetate of lead, iodine, iodide of potassium, carbonates of alkalies.

Ferrum pulveratum, Ferrum reductum—Aloes, vegetable infusions, extracts (*), substances containing tannin, metallic salts, alkaloid salts (*).

Ferri sulphas, or any soluble *Salts of iron*—Carbonates of alkalies (*), infusions of plants, extracts (*), substances containing tannin, mucilage.

Gum arabic (*Acacia*)—Chloride of iron (*), salts of lead, alcohol, ethereal tinctures, borax.

Gum resins: Asafœtida, Ammoniacum, Galbanum—Metallic salts, many ethereal oils, distilled aromatic waters, camphor.

Hydrargyri chloridum corrosivum, Corrosive sublimate—Carbonates, lime-water (*), iodide of potassium, opium (*), infusions of plants, substances containing tannin.

Hydrargyri chloridum mite, Calomel—Acids, acid salts, carbonates of the alkalies, lime-water (*), chloride of ammonium, liquor ammonii anisatus, iodine, iodide of potassium, chloride of iron, chloride of iodine, sulphur, sulphide of antimony (*), bitter almonds, emulsion of bitter almonds, aqua cerasorum, aqua amygdalæ amaræ, aqua lauro-cerasi, vegetable extracts.

Hydrargyri cyanidum—Chlorine water, salts of iron, salts of copper, salts silver.

Hydrargyri oxidum—Acids, alkalies, chlorine water, infusion of bitter almonds, bitter almonds in emulsion, bromide of ammonium, ferrous iron salts, chloride of ammonium, substances containing sulphur.

Iodum, Iodine—Water of ammonia, starch, powders containing starch, metallic salts, fatty oils (*), ethereal oils (*), emulsions, hydrate of chloral, carbonates of alkaline earths, gum arabic, tragacanth, salep, hyposulphite of sodium, unguentum kalii iodati of the Ph. Germ. (*), etc.

Kalium aceticum (*Potassii acetas*)—Should not be used in powders, pills, pastilles, etc., because it is strongly hygroscopic.

Kalium chloricum (*Potassii chloras*)—Mineral acids, organic substances, sulphur, carbon, calomel, etc.

Kalium iodatum (*Potassii iodidum*)—Acids, acid salts, alkaloidal salts, nitrate of silver, salts of iron, lead, or mercury, chloride of lime, chlorine water.

Kalium permanganicum (*Potassii permanganas*) — Organic substances, ethereal oils, alcohol, glycerin, ammonia and salts of ammonium, sulphur, carbon, etc.

Morphine, Salts of morphine—Oxides of iron, salts of iron, salts of manganese, salts of silver.

Liquor aluminii acetatis—Acids, alkalies, carbonates of alkalies, salts of potassium.

Liquor ferri oxychlorati (*Dialyzed iron*)—Acids, acid salts, substances containing tannin.

Mangani sulphas—The same as *Ferri sulphas*.

Moschus—Acids, acid substances, acetates, tannin, ergot, metallic salts.

Natrium bicarbonicum (*Sodii bicarbonas*)—Acids, acid salts, tannin, substances containing tannin, metallic salts, alkaloidal salts.

Natrium bromatum (*Sodii Bromidum*)—Mineral acids, chlorine water, salts of mercury.

Natrium Iodatum (*Sodii Iodidum*)—The same as *Kalium Iodatum*.

Natrium Salicylicum (*Sodii Salicylas*)—The same as Acidum Salicylicum.

Opium, Tinctura Opii, Extractum Opii—Alkalies and their carbonates, metallic salts (*), tannin and substances containing tannin, iodine, chlorine water, nux vomica (*), belladonna (*). [The two latter are mentioned here because they are or may be *physiologically* incompatible.—ED. AM. DR.]

Pepsinum—Alcohol, tinctures.

Plumbi Acetas, Sugar of Lead, Liquor Plumbi subacetatis, Subacetate of Lead—Gum arabic, emulsion of quince, tragacanth, opium, lime-water, carbonates, chloride of ammonium, sulphates (*), sulphuric acid, hydrochloric acid, iodide of potassium, iodine, tannin, and substances containing tannin (*).

Physostigmine (*Salicylate*) — Substances containing tannin, salts of iron, salts of mercury.

Stibii Chlorati Liquor (*Antimonii Chloridum*), *Butter of Antimony*—Watery liquids, alkaline substances.

Stibium sulphuratum aurantiacum, Antimonium sulphuratum (Golden Sulphuret of Antimony) — Liquor ammonii anisatus, bicarbonate of sodium, bitartrate of potassium, calomel (*), subnitrate of bismuth.

Stibium sulphuratum rubrum (*Antimonii Oxysulphuretum*, U. S. Ph., 1870), *Kermes Mineral*—Same as for the preceding.

Tartarus stibiatus (*Antimonii et Potassii Tartras*), *Tartar emetic*—Acids, alkaline substances, soap, calomel, substances containing tannin, rhubarb, cinchona, gum arabic (*), opium (*).

Vitellus Ovi (*yolk of egg*)—As given for albumen.

DANGEROUS COMPOUNDS OF DRUGS.

[A detailed report on Explosive Bodies and Mixtures has been given by one of us in NEW REM., 1878, pp. 165, 196. This paper comprised probably the whole of the previously recorded experience on the subject. The present chapter contains nothing particularly new, but the subject is one which cannot be treated of too often, to judge from the frequent accidents occurring through neglect of necessary precautions, in consequence either of the ignorance or the carelessness of dispensers.—ED. AM. DR.]

Under this head are classed mixtures of such drugs as undergo a change either during the process of preparation, or at a longer or shorter time thereafter, in consequence of which they either explode violently, become incandescent, burst into flame, or are decomposed with the appearance of fire. Such mixtures are dangerous to the dispenser and the dispensing establishment, and also to the patient and his surroundings.

Chlorate of Potassium; Chlorate of Sodium.—Even small portions of these salts, with SULPHUR, CARBON, IODINE, POWDERS OF METALS, such as reduced iron, ORGANIC SUBSTANCES, organic acids, such as SALICYLIC ACID, CAR-

* The basis of this series of papers is the last edition of Hager's "Technik der Pharmaceutischen Receptur." The editors have, however, found it desirable to omit certain portions which relate to matters of practice peculiar to Germany and to insert others which are more characteristic of American customs. Editorial additions are inclosed in [ ]. The use of the original text has been kindly granted by Dr. Hager.

BOLIC acid, and, furthermore, STARCH, SUGAR, or specially oxidizable substances, may produce frightful explosions, either by being rubbed in a mortar, or through a blow, pressure, or slight heating. The chlorate, when ordered in the shape of powder, must always be triturated by itself in a porcelain mortar. The mixing of the powder with oxidizable substances is done on a sheet of paper with the plume of a feather. The mixture must be poured out of the paper carefully (without the help of a spoon), and at a distance from a burning light, into a paste board box or paper bag. For fluid mixtures, the chlorate of potash should be dissolved by itself in water, and then the other ingredients mixed in with it. But even such watery mixtures may explode by exposure to a slight heat (for example, in the pocket, by the heat of the body). A mixture of a solution of chlorate of potassium with glycerin is always dangerous. If chlorate of potassium is to be dispensed in a mixture, it should always be considered whether there is danger in preparing it. Some inexperienced physicians attempt to combine GLYCERIN, ALCOHOL, CARBOLIC ACID, SALICYLIC ACID, OIL OF THYME, and other anti-diptheritics, with chlorate of potassium. Unless much water enters into the mixture, it is to be avoided [or steps should be taken to notify the prescriber]. The apothecary makes the mixture, the messenger puts it in his pocket, and the slight degree of heat is enough to cause an explosion.

CHLORATE OF SODIUM acts in the same manner as chlorate of potash.

Iodate of potassium, which has also occasionally been used in medicine, demands the same caution as chlorate of potassium.

Permanganate of Potassium.—Concentrated aqueous solutions of permanganate of potassium are decomposed by admixture with organic substances of all kinds (also with glycerin, alcohol, extracts, ethereal oils, syrups), furthermore with sulphur and substances containing sulphur, and with all organic acids, such as citric acid, carbolic acid, salicylic acid, etc., or with the salts of these acids, with attendant explosion. The mixture of dry permanganate of potassium with sulphur, organic substances, and above all, with oxidizable materials, may be followed by a dangerous explosion, accompanied by fire, so that the person who is preparing the mixture may lose his eyes, hands or fingers. Prescriptions of this sort should be rejected. Permanganate of potassium should be dispensed by itself alone, in watery solution, or in powder, or in the form of pills, with white bole [or vaseline and kaolin, etc.].

Iodine.—The solution of iodine in, or the admixture of tincture of iodine to fluids, which contain free ammonia in large quantity, causes the formation of the so-called iodide of nitrogen, a substance that becomes highly explosive under pressure or by heat. Iodine in ammoniacal LINIMENTS, with ammoniacal combinations (Hydrargyrum ammoniatum), should never be dispensed in salves, since the formation of iodide of nitrogen is always to be expected. Mixtures of iodine with ethereal oils may also result in explosion or flame. BROMINE behaves in a manner somewhat similar to iodine.

Chloride of Lime.—Mixtures of chloride of lime and sulphur explode sometime after being made. Chloride of lime also forms mixtures with certain organic substances, such as glycerin, ethereal oils, etc., which often do not explode or take fire at once, but this result follows after a time. If sulphur forms part of the mixture, an explosion or ignition is certain. Combinations of chloride of lime with chloride of ammonium, sulphur, glycerin, fats, or ointments, are always dangerous. The therapeutic object, the operation of the chlorine, is annihilated by its contact with the organic matter, and, consequently, the mixture is entirely useless; the mixture of chloride of lime with chloride of ammonium is especially dangerous, since the formation of the explosive chloride of nitrogen is the usual result.

Hypophosphite of calcium, potassium, or sodium, or any other hypophosphite must never be mixed with chlorate of potassium or of sodium, iodate of potassium, permanganate of potassium, or chloride of lime. A pharmacist who prepared a pill-mass from 2.5 *calc. hypophosphoros.*, 4.0 *kalium chloricum*, and 0.3 *ferrum lacticum*, was so injured by the attendant explosion and outburst of fire that he was confined to his bed for two weeks.

Oxide of Silver must be moistened with water before being mixed with oxdizable or organic substances. This precaution does not always prevent an explosion taking place later in the pocket of the patient.

Chromic Acid, also *Bichromate of Potassium* [and other bichromates], must be handled with special caution under certain circumstances. If, for example, the warm or hot solutions of the chromic combinations were mixed with glycerin, ethereal oils, or other organic substances, an explosion may happen, and the organic substances ignite readily, and if this should not take place at once, it may after a little time.

Picric Acid resembles chromic acid, and picric acid or picrates, such as picrate of potassium, etc., should never be mixed by dry trituration with organic substances, sulphur, iodine, etc.

Concentrated Sulphuric Acid. Mixtures of sulphuric acid and oil of turpentine are used in veterinary practice. Both fluids react on each other with unusual violence, but this reaction does not take place immediately, or at a lower temperature, but some time later, and is then sometimes accompanied by flame. When this takes place in a closed flask, a violent explosion will ensue. If some fatty oil (such as rape oil) is ordered in combination with the acid and the oil of turpentine—as is sometimes the case—the sulphuric acid is mixed with an equal volume of the fatty oil in an earthen vessel with diligent stirring. After the action of the acid on the oil (by disengagement of sulphurous acid) has terminated, small portions of the oil of turpentine are added at a time, and the mixture completed by stirring. The fluid having become cold, after standing for at least an hour, it is finally put into a flask and vigorously shaken up again, and set aside for a quarter of an hour before being corked up.

Spirit of Nitrous Ether, when mixed with tinctures or similar fluids, frequently causes a disengagement of gas, in consequence of which the bottle, if tightly corked, is burst, or else the cork is blown out and the effervescing fluid follows after it.

OPENING OF BOTTLES WITH GLASS-STOPPERS.

Although many fluids are of such a nature that the vessels in which they are kept should be closed with rubber-stoppers, yet, in deference to custom and show, glass-stoppers are generally used instead. If this is done, then the glass-stoppers ought to be *shortened*, so that, when the neck of a vial is three centimeters in length, only one centimeter should be completely filled by the glass-stopper, so that it can always be easily taken out. This is seldom thought of. The warning, therefore, is here given that *every glass-stopper which occasions frequent exertion and trouble for its removal should be shortened one-half.* The point at which it is to be cut off is filed (the file being moistened with petroleum), and then firmly grasped with a pair of tongs exactly over the filed mark, and the part broken off by a vigorous blow with a hammer on the tongs. The rough edge of the broken place may be rounded off somewhat by filing, with the help of petroleum. Vessels containing caustic alkalies, soluble glass, etc., should be furnished with rubber-stoppers; or the part of the glass-stopper which fits into the neck may be coated with *paraffin ointment* or a mixture of *paraffin* and *vaseline*, which are neither dissolved nor acted upon by alkaline fluids. The simplest way of loosening a glass-stopper which cannot be removed by twisting or pulling is to light a kerosene lamp, put a narrow glass-chimney on it, and over this to heat the neck of the flask gradually, turning it on its axis, and trying from time to time whether the stopper is loosened. A bottle may almost always be opened in this manner. If the bottle contains volatile *inflammable* liquids, the manipulation over the lamp may be attended with danger. In this case, resort must be had to other means, such as knocking the stopper against a wooden surface, or striking the stopper on all its sides successively with some wooden implement. If there is no immediate necessity for opening the bottle, some liquid that will dissolve the cementing material may be poured, by means of a dropping-glass, into the groove between the stopper and the mouth of the bottle. If the vessel contains fluids which are dangerous if brought near the fire, the neck of the vessel may be placed in hot water for a couple of minutes. There is also a stopper extractor, made of wood, with which the top of the stopper is held fast, while the vessel is forcibly turned on its axis. This last contrivance is specially recommended for shelf bottles containing inflammable substances.

[To the preceding note taken from Dr. Hager's work, we append the following:

ADDITIONAL REMARKS ON EXTRACTING GLASS-STOPPERS.

The fixation of glass-stoppers in the necks of bottles may be due to several, very different causes. The principal ones of these are the following:

1. The stopper has been inserted at a moment when the neck of the bottle had a higher temperature than the stopper. In this case, the neck had a slightly wider diameter, so that when it cooled to the same temperature as the stopper, the latter was held with a force which may approach that of the breaking point of the glass.

2. The nature of the liquid contained in the bottle is such that it has attacked the surface of the glass, both on the stopper and on the neck, and has produced a sort of cement which unites them together.

The cause first mentioned is of the most frequent occurrence. Almost every case of a fixed stopper, which is not due to the second cause, or to some sticky substance accidentally confined between stopper and neck, is traceable to it.

It is annoying to be, as it were, pulled up short just at a busy moment, when a fresh bottle is to be opened, and the stopper refuses to yield. Many persons lose patience in such a case, get excited, employ either the wrong method or improperly apply what would have been the correct method, and fail in their attempt. That is, they generally manage to get at the contents of the bottle, but often at the sacrifice of the container, and, perhaps, some of the contents.

When an obstinate stopper is encountered, it is necessary to use circumspection deliberation, and *patience*. Regard must be had in the

first place to the nature of the contents.

If the contents are *non-explosive, non-inflammable,* and *not caustic,* and the bottle and stopper are substantially made, so as to bear a moderate force, any of the following methods may be applied.

The stopper and neck are first thoroughly cleaned, so that when the bottle is opened, no dirt or foreign substance may fall into it. It is often necessary to insert the point of a penknife into the groove between the upper edge of the neck and stopper, to remove adhering cement or wax. At all events, as much of this as can be reached should be picked out. The bottle is now placed upon a solid wooden support, firmly grasped with one hand about the neck, and the thumb of the same hand pressed against one corner of the stopper. The other corner of the stopper is then struck, from the opposite side, a series of taps or blows with the wooden handle of a spatula or knife, until it becomes loosened. The wooden handle should contain no metallic parts, as these may accidentally come in contact with the glass stopper and shatter it. And the blows directed against the stopper must be so regulated that the thumb is pressed against the opposite corner at precisely the same moment, with about the same amount of pressure as the force of the blow amounts to. If the stopper has a slender neck, blows would be too much for it to stand. A series of rapidly repeated taps, with simultaneous bearing with the thumb against the other edge, will in most cases suffice.

If this method fails, it is well to try whether twisting or wrenching will not be able to remove the stopper. This may be accomplished either by using one of the well-known wooden stopper-wrenches, or by improvising such an article from any kind of tool or contrivance available. The handles of a pair of tongs, padded with a towel or cloth, will often answer. In using this method, some skill and considerable care are necessary. The bottle should be firmly grasped near the neck, and the wrench having been placed over the stopper, a firm but steady twisting motion should be used, proportionate to what may be judged suitable to the strength of the bottle. As there is always danger of twisting off the neck or upper part of the bottle, and the hand may be more or less seriously cut, it is advisable to wrap a towel around the glass where it is to be grasped by the hand. Instead of a steady twisting motion, some persons prefer to use a sudden wrench. If, however, the force employed is not nicely adjusted to the strength of the material, fracture will often result in this case. It must be remembered that glass will stand but little twisting and bending. Hence, if the direction of the forces employed in trying to twist the stopper and the bottle in opposite directions, is not in parallel planes, there will be an additional risk in breaking the bottle or stopper.

If either of the above methods fail, heat may be used. We are still assuming that we have to do with a *non-explosive, non-inflammable,* and *non-corrosive* liquid. In such cases, the application of heat, when properly performed, will almost always be successful. And if it should result in a fracture of the neck, no accident can result. There are several ways in which heat may be applied. We prefer an ordinary gas burner, giving a fish-tail flame, or a horizental burner, such as are applied over billiard tables. The neck and stopper having previously been thoroughly cleaned, the neck of the bottle is held up against the thin edge of the flame, and rapidly rotated, being withdrawn every second or so, until it has become quite warm. Care must be taken not to heat the stopper. The bottle is now set on the table and the stopper attempted to be removed by hand. If it will not start, further heat may be applied, and the operations repeated until it becomes loose.

Other methods of applying heat will be mentioned further on.

Sometimes a stopper may be loosened by inserting the bottle neck-down into water, oil of turpentine, benzin, or other liquids, which will gradually find their way upwards between the neck and the stopper, up to where actual contact of the glass takes place. This method is, however, uncertain, and is likely to be of use only when there is some substance confined between the neck and the stopper which is soluble in the liquids mentioned.

So far, we have assumed that we have to do with harmless liquids. It is, however, quite as common, if not more so, that the contents of such a hermetically sealed bottle are either highly volatile, or inflammable, or corrosive.

If the liquid is *corrosive* or *caustic,* great care must be exercised in applying any method requiring force. If a bottle of acid (for instance, one of the usual five-pint bottles of nitric acid) is to be opened, and the stopper is found to be obstinate, it is *always* best to make provisions against damage that might result from a breaking of the bottle. An experienced person will at once know, from the resistance some particular stopper offers, or from the apparent flimsiness or thinness of the glass of the bottle, that there may be some risk in such a case. He will, therefore, put the bottle in a place where it may do no harm should it break. We have ourselves experienced and been present at several accidents of this kind, and when we have to handle a doubtful bottle, place it on a thick sheet of rubber laid on the bottom of a flat-bottomed stone-jar of suitable capacity. We have several times had cause to congratulate ourselves at having done this.

Even when it is supposed unnecessary to adopt the precaution just mentioned, it is always advisable to wrap a towel around the whole bottle and the neck, and also to throw one fold of the towel over the stopper, before tapping or twisting the latter. Sometimes there is sufficient pressure of the confined air or gas to project some of the liquid in the form of spray or drops, and this may be thrown into the face or eyes of the operator. The towel will prevent such an accident.

This precaution is particularly necessary when opening bottles containing stronger water of ammonia.

If the liquid is *caustic* and strongly *alkaline,* and the stopper has once become fastened, it will generally be found impossible to remove it, as the glass of stopper and neck has been chemically cemented together. There is no other way but to break off the neck. Here it is also safest to place the bottle in a suitably sized stone-jar, and then to knock off the neck by a smart blow with a hammer. A string having been previously tied around the neck, and the end of the string being held in the hand, the broken-off portion can at once be removed.

If the liquid is *volatile* and *inflammable,* the safest plan is, under all circumstances, to loosen the stopper by tapping, a towel being wrapped around the bottle and a fold of it being thrown over the stopper. Bottles of this kind must be manipulated at a distance from lights or fires. It should not be forgotten that inflammable vapors, when ejected under pressure, may be ignited from a comparatively distant flame. Hence, particular care should be taken at night time in opening bottles containing ether and the like. Accidents have happened, not only through vapor, under pressure, being ejected against a burning light, but also from the whole contents being spilled through fracture of the bottle, so as to produce an explosive mix- of vapor and air.

Sometimes the confined vapors are under a great pressure, dangerous to the operator. When *nitrite of amyl* had been introduced for a short time, one of us was in the habit of receiving supplies of this liquid in glass-stoppered pound bottles. Several of these had been opened without trouble, until one was encountered which obstinately refused to part with its stopper for some time. It was treated in the usual manner, by tapping the stopper, but no towel was thrown over it. Attention being for a moment directed elsewhere, while the tapping was mechanically continued, the stopper was suddenly loosened and projected with such force against the ceiling that it made a deep dent against it. A great volume of vapor was thrown out at the same time, seriously affecting the writer for a short time. But this was not all: in its flight towards the ceiling the glass-stopper grazed his forehead, cutting a gash into it. Had the stopper struck the face fairly, its force was sufficient to have done most serious injury.

When it is desired to heat the necks of bottles containing inflammable liquids, and an open flame is therefore inadmissible, hot water or friction may be used. The bottle should first be properly cooled, so that there may be as much difference as possible between the size of neck when cold and when hot. A thin rag, or the end of a towel is then wrapped around the neck and very hot water allowed to drain over it, care being taken that none of it touches the stopper. The latter should be frequently tried, and removed as soon as it is loose. The neck may also be heated by friction with a string passed several times about the neck. This may be preferable when it is feared that the hot water may cause a fracture of the bottle, and it is undesirable to have water mix with the contents.

When a fixed stopper has been loosened and removed, it should not be re-inserted into the neck of the bottle until this has become entirely cold again. Whenever admissible, the stopper should be coated with a very thin film of paraffin or vaseline.

Unfortunately, there are certain shapes of glass stoppers which are very liable to break when manipulated, or such as do not offer a sufficient hold to permit being firmly grasped. As an example of the former, may be mentioned the wide-mouthed glass-stoppered bottles in which Schering's or Saame's chloral hydrate is put up; and as an example of the latter, the pound bottles in which iodine is usually sold.

Neither of these, when stuck fast, can be loosened by tapping, without risk of breaking the stopper. They must be loosened by heat. Round or so-called mushroom stoppers can be loosened either by tapping or by heat only, as their shape does not admit the use of a wrench. If tapping with the wooden handle of a spatula is used, it is necessary to direct the blows from below upwards, an upward pressure with the finger or thumb being at the same time applied at the opposite part of the stopper.

Bottles containing *Bromine* often give much annoyance. It is unsafe, *under all circumstances,* to attempt the removal of fixed stoppers in *large* bromine bottles, except with proper precautions. Provision must be made that the current of bromine vapor, after the bottle is opened, do not pass over the operator, but away from him, and the bottles should be placed into a jar containing enough water to reach above the level of the within-contained bromine. Should the bottle break during the effort made to extract the stopper, the bromine will be covered

by a layer of water. Very serious, and even fatal, accidents have happened through failure, on the part of the operator, of observing such precautions. A bottle of dilute water of ammonia should also be within his reach, in case of his inhaling any of the vapor. The small bottles (1 oz.) of bromine often give more trouble than the large ones. After the cement has been removed from the neck, and the bottle has been freed from the label and thoroughly cleaned and washed, tapping the stopper may be attempted if it will not become loose without force. Frequently it will be found to be permanently fixed. The most simple way then will be to place the bottle in a mortar, fill the latter with water, and break the bottle with a pestle. The water being then nearly all poured off, the remainder may be poured into a separating funnel, or into a glass-stoppered burette, and the bromine drawn off for use.

A great deal more may be said or written about this subject. For the sake of the younger members of the profession we will append a few general rules which the experienced may often neglect without harm, but the observance of which will probably save many from injury.

1. Always assume that the liquid confined in the bottle *may* do harm if suddenly released.

2. If you do not know for certain that the contents are non-inflammable, treat the bottle as if the contents were inflammable. And in this case always have a sufficient quantity of *water* ready at hand to put out an incipient fire.

3. If the liquid is of an acid, alkaline, corrosive, or irritating nature, handle the bottle so that no damage can accrue to your person or the surroundings from a fracture of the bottle. Rather make the arrangements so that the contents may be saved. Have at hand proper antidotes when handling highly irritating substances. —Ed. Am. Dr.]

Australian Opium.

The duty of 20*s.* per pound avoirdupois which is levied on all opium imported into Victoria tends to encourage the cultivation of the opium poppy, which was introduced into the colony many years ago, by Mr. Bosisto. In 1870, Mr. Bosisto published the results of his experimental opium farming, and since that time the experiments have gradually extended so that now it may fairly be said that opium farming is established, and the production of opium increasing. The poppy cultivated in Victoria is the white-flowered *Papaver somniferum*, var. *glabrum*. It grows exceedingly well, generally to a height of eight feet, and the capsules are of good size, about three inches being the extreme diameter. Samples of the capsules, in the Colonial and Indian Exhibition at present being held in London, are shown in the Victoria court. Three balls of the opium obtained from the poppy are also exhibited. The opium is of firm consistence, somewhat tenacious, and being quite free from insoluble matter, it is devoid of the granular appearance of Turkey opium. It is also somewhat lighter in color, and, when dried and powdered, is similar in color to powdered jalap. The odor of the drug is similar to that of the best samples of Turkey opium. It contains 12 per cent of moisture, and from the powder 11.5 per cent of morphia were obtained, so that it contains in the moist state 10 per cent of the alkaloid. If Victoria can produce an article so good as this, it is a pity that she should throw away a single sovereign on the imported article. It is hoped that ere long the need for the import duty will disappear, and that other colonies will follow Victoria's example in producing what drugs they can.—After *Chem. and Drugg.*

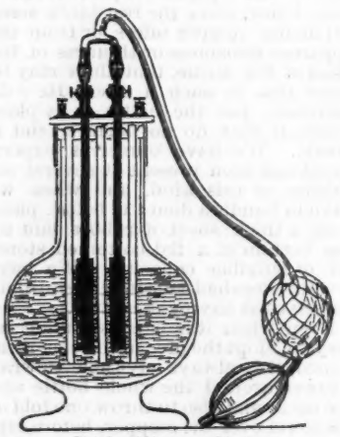
IMPROVEMENT IN BICHROMATE BATTERIES.

When air is prevented from having access to the solution of chromic acid or bichromate of potassium in the Bunsen battery, it soon becomes inoperative or exhausted. To prevent this, E. M. Reiniger, of Erlangen, (Germ. pat., No. 35,487), proposes to employ hollow zinc electrodes, and to connect them with any kind of blowing apparatus or hand bellows, by means of which a current of air may be passed into the solution when required.

The Active Constituent of Senna.

R. Stockmann has re-examined the constitution of cathartic acid, the active principle of senna leaves, which Kubly reported to contain both nitrogen and sulphur. Stockmann finds that these last-named elements are not present, and that Kubly's results were due to an impurity contained in the substance examined by him.

The author confirms the statement that cathartic acid is the only active principle of senna.—*Arch. f. exp. Pathol.*, 19, 117.



Reiniger's improved battery.

New Morphine Reactions.

Dr. J. Donath announces (in *Journ. f. prakt. Chem.*, 1886, 564) that he has discovered two new characteristic reactions of morphine. One of these is based on Tattersall's reaction, by means of sulphuric acid and arseniate of potassium.

Finely powdered morphine (about 1 milligramme) is intimately triturated in a porcelain capsule with 8 drops of concentrated sulphuric acid, a small fragment of arseniate of potassium added, and again triturated. If the capsule be now heated by rotating it over a flame, until acid vapors begin to be given off, a handsome *bluish-violet* color is produced which becomes *dark brownish-red* on further heating. On cautiously diluting with water, a *reddish* tint is produced, which becomes *green* by further addition of water. If the fluid is poured into a test-tube, chloroform added, and the mixture agitated, the chloroform acquires a magnificent *violet* tint.

Ether is likewise colored reddish-violet, while the layer of liquid below it is brown.

The second reaction is obtained with sulphuric acid and potassium chlorate, and resembles the ferric chloride reaction (Vitali has employed the beforenamed reagents, but in a different manner).

A little morphine is triturated with about 8 drops of concentrated sulphuric acid, and 1 drop of a cold solution of 1 part of potassium chlorate in 50 parts of concentrated sulphuric acid is added. The mixture then acquires a fine *grass-green* color, which lasts a long while. At the margin of the liquid, a faint *rose-red* tint is noticeable.

The author discovered these reactions while searching for some means of distinguishing between morphine and dehydromorphine, one of the products of the decomposition of morphine. For this purpose, the above two reactions are exceedingly distinctive. It remains to be seen, however, whether any other *natural* alkaloids will give similar results with the reagents.

The Cocaine Habit.

From a paper by Dr. A. Erlenmeyer, director of the Asylum for Nervous Diseases in Bendorf on the Rhine, published in the *Deutsche Medicinal Zeitung* (No. 44, of 1886), we translate the following abstract, after the *Pharm. Zeit.*

"The cocaine habit has been added to the alcohol and morphine habits as a worthy third scourge of humanity. Like the former, it afflicts every one who yields to it, with the most serious damages to body, mind, and morality.

"At present, we are only at the threshold of the development of this most recent morbid craze. But when I consider that the morphine habit required nearly ten years for its full development, while the cocaine habit has become firmly established after a single year subsequent to the discovery of the properties of cocaine, I have no doubt that we have here an enemy of tremendous power, which must be fought with knowledge, circumspection, and energy."

The author has collected observations upon 13 patients: 5 physicians, 2 wives of physicians, 3 army officers, 1 author, 1 landed proprietor, 1 official. The cocaine habit appeared in two forms. In one series of cases, only cocaine was taken; in the other, cocaine was combined with morphine. In every one of these cases, the use of cocaine could be traced back to the previous use of morphine, and the suggestion of its employment was derived from lay papers.*

The disease is developed in a very simple manner. The morphine eater either tries to cure himself with cocaine or is treated with it by some physician. In almost every case the plan fails. If the attempt to substitute the cocaine for the morphine succeeds, the patient has got rid of the morphine habit, but he has become a slave to cocaine. And if it does not succeed, he may require perhaps a somewhat smaller dose of morphine, but will have to use cocaine in addition.

When the cocaine habit becomes developed, it exerts a rapidly destructive influence upon mind an body.

Cocaine, like morphine, is usually taken hypodermically. Wherever it is injected, hard nodes, of the size of hazel-nuts, are formed in the cellular tissue, and these nodes persist for months.

Cocaine causes disturbances of respiration; it also causes excessive perspiration and fainting spells. For this reason, persons addicted to cocaine should never be anæsthetized with chloroform.

With larger doses, a rapid falling away of the bodily weight is noticeable, amounting sometimes to 20 to 30 per cent in a few weeks. At the same time, it does not appear in such cases that they suffer from loss of appetite.

The whole appearance of a person addicted to cocaine is much worse than that of a slave to morphine.

*In the case of the physicians, and physicians' wives, it is more likely that the suggestion arose from articles contained in the professional press.—Ed. Am. Dr.

The author mentions as further symptoms, more of a psychical character, the following: sleeplessness, mental derangement (of various degrees and kinds), gradual loss of memory, abnormal prolixity in conversation, correspondence, etc.

According to the author, alcohol used in excess is the only other substance that can produce as deep a destruction as cocaine.

Kola and Kola Paste.

FOR some time past, an article has appeared on the market, under the name Kola Paste, which promises to be useful as a source of caffeine, or, at least, to serve as a substitute for other substances containing caffeine.

Thomas Christy, in his "New Commercial Plants and Drugs" (No. 8, p. 6), was the first to draw attention to this paste. He says:

"I now have to record one of the most important discoveries that has yet been made with the nut of *Sterculia acuminata, i. e.*, that these nuts can be prepared by a special process, and made into a paste that could not be distinguised from fine cocoa paste (made from *Theobroma Cacao*). This paste has been tested in this country [England] in many ways, and the results are worth mentioning." (See AMER. DRUGG., 1885, 133).*

We have been favored by Messrs. Lloyd Brothers, of Cincinnati, with a sample of the paste, such as it has been supplied to the Smithsonian Institution and to the Surgeon-General of the Navy. It is not known how it is prepared, but it is stated by the agents to be a perfectly pure article, without any admixture, and believed to be "only a product of fermentation."

The physiological effects attributed to the drug at its habitat are similar to those ascribed to cocoa: "Its use is said to enable the natives of the west coast to endure prolonged exertion upon a mere modicum of food, while the whites living among them believe they escape the deleterious influence of the climate by chewing a small quantity before their meals. The negroes themselves consider it a sure prophylactic against dysentery. Among the men on the estates and in the garrison towns of west African settlements, Kola has the apparently well-founded reputation of dissipating the effects of an alcoholic debauch. From what is now known of its therapeutic properties, it is undoubtedly true that it does overcome the stupefaction and confusion of intellect which follows drunkenness. It is even maintained that it destroys the appetite for alcoholic drinks, and that after the use of the Kola cure a drunkard cannot return to his cups for some days without being nauseated. Finally, the natives believe it to possess aphrodisiac powers."† The esteem (almost veneration) in which these tribes held it attracted the attention of the naval surgeons, and they employed it in chronic diarrhœas of hot climates with success; also in cardiac affections and in the cachexiæ. Thus it evidently came to the attention of the Surgeon-General of the United States Navy, who supplied it to several medical officers, and the subsequent reports of these gentlemen are of such a nature as to direct the careful attention of American physicians to Kola paste.

According to Medical Director Gihon and Medical Inspector Hudson, of the U. S. Navy, the drug appears to be serviceable in certain forms of nervous affections accompanied with painful headache. Dr. Hudson administered it like chocolate, from 7 to 10 Gm. (105 to 150 grains) of the paste being grated finely, and boiled in a teacupful of milk, with subsequent addition of sugar. It was generally given only once a day.

Messrs. Lloyd Brothers give the following directions:

DIRECTIONS FOR USE.—Mix the prepared Kola paste with sugar, if not sweet enough, then add milk or water, boil, and stir well. This produces "a rather pleasant beverage," which should be drank *hot*, like chocolate, stirring well before administration. Take twice a day, once about two hours after breakfast, and again in the middle of the afternoon.

DOSE.—From one to four drachms at a dose is an average, although circumstances may demand an increase or a decrease of the amount.

Kola has already been used, in an experimental way, as a source of caffeine, and it is expected that its cultivation and export will form an important object of African settlers in the future. The shrub is already widely distributed in other countries, as will be seen from statements to be given below.

In view of the interest attaching to the subject of kola, we append portions of an abstract of a report made by Heckel and Schlagdenhauffen, which has appeared in the *Pharm. Jour.*

"Among the vegetable products of the African soil, there are perhaps none more interesting and valuable than those which under the various names of 'kola,' 'gourou,' 'ombene,' 'mangue,' and 'kokkorokou,' are used as articles of consumption throughout tropical and equatorial Africa, as equivalent to tea, coffee, maté, and cocoa. Used under the form of seeds, probably from time immemorial, by the native tribes, these products are of varying botanic origin, and their history has been up to the present time imperfectly known; but the authors have been able to avail themselves of the observations of some recent travellers to clear up some obscure points.

"The products which are included by the authors under the name 'kola' (the various synonyms quoted being special to particular countries), consist of seeds, yielded by two families of plants and differing very much in appearance. The kind most widely distributed, the true kola, which by some of the natives is called the 'female kola,' comes from the *Sterculiaceæ;* another variety, called by the authors 'false kola,' is known among the negroes as simply 'kola,' or 'male kola.' Before the author's researches, only the 'true' or 'female' kola was known, and it had been ascertained to be yielded by the *Sterculia acuminata* P. de Beauv. (*Cola acuminata* R. Br.). To this, Messrs. Heckel and Schlagdenhauffen are able now to add information concerning the 'male' kola, hitherto unknown, and to give reasons for believing that various other species of *Sterculia*, besides *S. acuminata*, yield kola seeds.

"Dealing first with 'female' kola, the authors describe at length *Sterculia acuminata* from specimens, the description agreeing with Oliver's description of Var. a ('Fl. Trop. Af.,' i., 220). According to the best information, the tree—which is from thirty to sixty feet high, and in general aspect resembles the chestnut—grows wild upon the western coast of Africa, comprised between Sierra Leone and the Congo, or Lower Guinea, reaching into the interior about five or six hundred miles, where it appears to follow the limits of the palm. Upon the eastern coast it appears to be unknown in places where it has not been introduced by the English. Dr. Schweinfurth, speaking of the country of Nyamnyams, near lake Nyanza, says that among the imposing forms of vegetation a *Sterculia* of the kola kind predominates, and is called locally 'kokkorokou.' In the country of the Momboutous, too (24° E. long., 3° N. lat.), upon asking for kola he was supplied with the fruit in its rose-colored envelope; but the only information he could obtain there concerning it was, that the nuts were found in the country in the wild state, and were called nangoné by the natives, who chewed slices of it whilst smoking. Karsten, in his Flora of Columbia, describes the plant as growing wild in the moist hot woods near the southern coast of Venezuela, but the authors believe that it was probably introduced there about the same time it was introduced into Martinique, and that it was sown by African negroes, who brought it into those countries in the same manner as they are known to have introduced *S. cordifolia*, for the sake of its delicious fruit. It has also been introduced successfully by the English into the East Indies, the Seychelles, Ceylon, Demerara, Dominica, Mauritius, Sydney and Zanzibar, and by the French recently at Guadeloupe, Cayenne, Cochin China, and the Gaboon. In all these stations the kola tree flourishes best in moist lands at the sea level, or a little above. At Sierra Leone some fine trees are found at an elevation of 200 or 300 meters, but not higher than that.

"The kola tree commences to yield a crop about its fourth or fifth year, but it is not until about its tenth year that it is in full bearing. A single tree will then yield an average of 120 pounds of seed annually.

"The collection is conducted with great care and is made by women. The seeds are removed from the husk and freed from the episperm. In order to maintain their value among negroes, it is necessary to keep them in a fit state and in good condition. They are, therefore, carefully picked over, all damaged and worm-eaten seeds being removed, and the sound seeds are then placed in large baskets, made of bark and lined with 'bal' leaves (*Sterculia acuminata*, or *S. heterophylla* Beauv.?)* the seeds are heaped up and then covered over with more 'bal' leaves which, by their thickness, resistance, and dimensions, contribute not a little to the preservation of the seeds by keeping them from contact with dry air. Packed in this manner, the seeds can be transported considerable distances, remaining free from mould for about a month, during which time it is not necessary to submit them to any treatment in order to preserve them fresh beyond keeping the 'bal' leaves moist. But if it be desired to keep them beyond that time, the operations of picking and repacking have to be repeated about every thirty days; the seeds being washed in fresh water and fresh 'bal' leaves placed in the baskets. The baskets usually contain about three cwts. of seeds. It is in this condition that 'Kola' is sent into Gambia and Goree, where the principal dealings in the seeds are carried on. In Gambia they are sold in the fresh state to merchants travelling with caravans into the interior, who dry them in the sun and reduce them to a fine powder, which is used, mixed with milk and honey, by the tribes of the interior to make a very agreeable, stimulating, and nourishing beverage. It most frequently arrives at Sokota and Kouka, in the Soudan, and Timbuctoo, where large sales of the seeds are made, in the fresh condition; from the Soudan markets it is carried by caravans to Tripoli, and from Timbuctoo into Morocco. As might be expected, the value of the kola increases as it makes its way into the interior of Africa, and the authors state that some of the tribes furthest removed from the sea pay for the dry powder with an equal weight of gold dust. Kola plays an

* On Kola Nut, see our articles published in NEW REM., 1881, 34, and AM. DRUGG., 1885, 5, both of which are illustrated.

† Philadelphia Medical Times, Sup. cit.

* The leaves received in England wrapped around cola nuts appear to belong to some Dipterocarpus tree.—T. C.

important part in the social life of many of the African tribes. An interchange of white kola between two chiefs is indicative of friendship and peace, while the sending of red kola is an act of defiance. An offer of marriage is accompanied by a present of white kola for the mother of the lady; the return of white kola is equivalent to acceptance of the suit, whilst red means rejection. The absence of a supply of kola from among the marriage presents would endanger the whole arrangement. All the oaths are administered in the presence of kola seeds; the negro stretches out his hand over them whilst he swears, and eats them afterwards.

"Concerning the 'male kola' or 'bitter kola,' as before stated, nothing definite was known, and as recently as the year 1882 it was referred erroneously to a species of *Sterculia*. In the Flora of Tropical Africa, Oliver says: 'The bitter kola of Fernando-Po is the product of trees belonging to the Guttiferæ. The authors were led by this remark to attempt to obtain from various parts of the eastern coast specimens of the plant yielding "bitter kola," and although the flowers did not reach them, they received specimens of the branches, leaves, and fruits, together with a sufficient quantity of seeds to allow of a complete analysis being made. All the specimens received from various places correspond in their characters, and showed that the bitter kola is the product of a single Guttiferous species, and not of several. From the material at their disposal the authors refer it to a new species, *Garcinia Kola* Heckel.'

"In its known characters, the plant would appear to be closely allied to *Garcinia Morella*, which, however, is essentially an Asiatic species."

On Njimo Wood.

LAST year a considerable quantity of wood was imported into Germany from the country beyond the Cameroons, under the name "njimo wood," with the statement that it had digestive properties similar to pepsin. It occurred in pieces of stem wood, sparsely covered with bark, and in thick sections of a cylindrical root uniformly covered with bark. The inner parts of the root pieces, as well as the wood itself, were of a beautiful yellow color, in some places intensified to reddish. Seen through a lens the stem wood and root seemed permeated with numberless round pores, containing a yellow resin that was colored brown by soda solution. The wood was easily reduced to a coarse powder with a rasp, and had a peculiar and agreeable odor, resembling musk.

Nothing was known as to its botanical origin. With a view to test its alleged digestive properties, Dr. Schulz prepared an aqueous extract by digestion in 10 parts of water on a water-bath, and another with cold water; both, however, proved incapable, either with or without the addition of hydrochloric acid, of exercising any digestive effect upon albumen (*Pharm. Zeit.*, June 12th, p. 350). An alcoholic tincture of the wood proved equally powerless, and a resinous extract obtained by its evaporation when injected subcutaneously into a frog produced no special effect. The extract, like the wood when chewed, had a strong, pure, bitter taste, and the peculiar smell of the wood. The alcoholic tincture differed from the aqueous preparation in presenting a remarkably beautiful fluorescence. In transmitted light the tincture was of a beautiful yellow color, but in reflected light it presented a sheeny green with the peculiar velvety tone of uranium glass. A more concentrated tincture, made with absolute alcohol, was of a beautiful dark-red yellow color with the green fluorescence. The alcoholic tincture gave no alkaloidal reaction with potassium iodo-iodide solution.—*Pharm. Journ.*, June 26th.

Kaolin as an Excipient for Oxidizing Substances.

SOME time ago, Mr. Martindale recommended, as the most suitable excipient for permanganate of potassium and other oxidizing substances, the following mixture:

Vaseline	3 parts.
Paraffin	1 part.
Kaolin	3 parts.

Three grains of this mixture were directed to be used for every pill containing 2 grains of the permanganate. As a further precaution, these pills are to be coated with a solution of sandarac in absolute alcohol.

Recently Mr. Geo. Smith, F.C.S., examined a number of these pills which had been made some 17 months before, and it was found that if they were reduced to powder, with the coating, and the permanganate estimated, the result showed an amount of reduction equivalent to 70 per cent. If the sandarac coating was previously scraped off, the reduction amounted to only 47 per cent. Therefore, the sandarac coating brought into intimate contact with the permanganate caused a loss of 23%. It was therefore considered desirable to pursue the investigation further on a pill-mass *per se* made according to the above formula. The best white vaseline and washed kaolin were used in preparing the excipient, and the pills were allowed to remain about nine months before being examined. The pills were found to contain 77.82 per cent of unreduced permanganate, which is regarded by Mr. Smith as a proof that Mr. Martindale's excipient practically answers the purpose, provided only the minimum amount of excipient is taken.

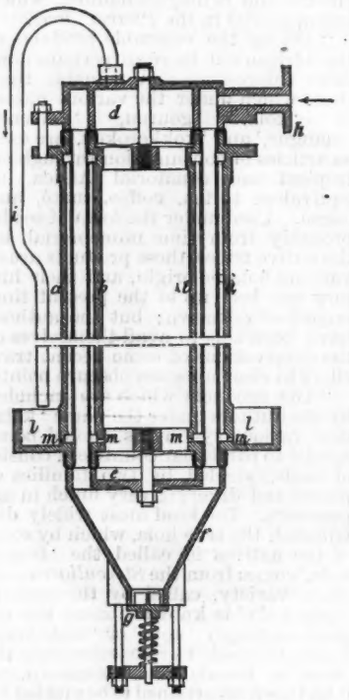
The author has also examined the applicability of the excipient to pills containing gold or silver salts, and he pronounces it as perfect, at least so far as nitrate of silver is concerned. In the case of chloride of gold and chloride of gold and sodium it was not satisfactory.

The author thinks that the excipient can probably be improved by raising the purity of the ingredients. That which he has used in his own experiments was prepared from

White Vaseline	3 parts.
Best White Paraffin	1 part.
Washed Kaolin	3 parts.

—After *Pharm. Journ.*, May 15th.

[*Note of Ed. Amer. Drugg.*—It seems to us that the resistance to oxidation, in the ingredients above mentioned, could be greatly increased by treating them, previously, with a sufficient quantity of permanganate of potassium until this salt is no longer affected. The vaseline and paraffin might be melted together in a flask containing boiling distilled water, strongly acidulated with sulphuric acid, and enough permanganate might then be added, in small portions at a time, until, after protracted boiling, the tint of the liquid remained unaltered. The watery liquid could then be poured off, and the remaining mixture washed with pure distilled water until all trace of acid was removed. The kaolin could be easily purified separately, in the same manner. Finally, the three ingredients, thus freed from most or all impurities exercising a reducing action might be mixed together and kept, in a securely covered vessel, for use.]



Wagner's continuous filter press.

A CONTINUOUS FILTER-PRESS.

IN order to avoid the great loss of time involved in emptying and recharging the ordinary filter-presses, E. Wagner, of Freiburg, Baden, has designed a circular filter-press, which can work continuously.

Two cylinders, *a* and *b*, are placed within each other. They are provided with longitudinal grooves, and covered with filtering cloth of suitable strength. For this purpose, the inner cylinder may be taken out. The two cylinders are kept in their position by a common cover *d*, in such a manner that a circular space remains empty between the two cylinders. The inner cylinder *b* is closed at its other end by the cover *e*, and the external cylinder by the funnel-shaped expansion *f*, provided with a compression vent *g*. The covers *d* and *e*, and the funnel *f* at the same time serve to hold in place the the edges of the filter cloths.

The magma which is to be pressed is forced into the space between the cylinders, through the joint *h*. In passing down it yields up its liquid, by continuous pressure, and the liquid passes into the grooves behind the cloth, and from there through the openings *m*, both in the outer and inner cylinder.

That which comes directly from the outer cylinder passes at once into the circular reservoir *l*; the contents of the inner cylinder find their way there through the tube *i*.—*Dingl. Polyt. Journ.*, 260, 317.

Oleum Hyoscyami.

As a supplement to the note on olea cocta, and particularly oleum hyoscyami, contained on page 107 of our June number, we take the following from the *Pharm. Zeit.* (No. 28).

"An oleum hyoscyami of a handsome green color may be obtained by heating the oil with the herb in *brass* (*not* copper) vessels. As this oil is only used externally, and copper is often used externally for various purposes by physicians, the small percentage of copper in the oil will not be objectionable."

Note.—As the formula given in our June number produces a handsome product, without having recourse to a subterfuge, the propriety of which is more than doubtful, we cannot indorse the above proposition. Rather accustom the public and the prescriber gradually to a less handsomely tinted product than put in their hands a "make-believe."—ED. AM. DR.

Carl Wilhelm Scheele.

[Born at Stralsund, December 19th (or 9th?), 1742. Died at Köping, May 21st, 1786.]

THE centenary of the death of this pioneer on the field of chemical research has been worthily commemorated by a memorial paper from the pen of Prof. F. A. Flückiger, in the *Archiv der Pharmacie.* The memorial is accompanied by a lithographed portrait of Scheele, derived from a woodcut accompanying his biography published some twelve years ago in the Swedish "Familjejournal."* Every existing portrait of Scheele, with the exception of perhaps one, has been ascertained to have been sketched after his death, from memory. The exception is a portrait painted upon ivory, at present in the possession of a Berlin painter, Mr. Brüggemann. It represents him as a young man, but the features differ somewhat from those shown in the accompanying portrait. The search after an authentic portrait of Scheele has become an important matter, as it is to be used in modelling his features for a statue to be erected in Stockholm.

Carl Wilhelm Scheele was born on December 19th (perhaps 9th), 1742, at Stralsund, being the seventh child of Johann Christian Scheele, grain dealer and brewer, and his wife, whose maiden name was Margaretha Eleonore Warnekros. His father was not successful in his business undertakings, and Carl Wilhelm, therefore, did not enjoy superior advantages of education. After having passed through a private school, and having been taught by professional friends of his parents the art of deciphering or reading prescriptions and the meaning of chemical and pharmaceutical signs, a friend of the family, Bauch, apothecary at Gothenburg, took him as apprentice (1757). He was soon relieved from purely mechanical work and transferred to the laboratory, where he exhibited great zeal and diligence, not being satisfied with the routine work itself, but meditating and speculating on the theory of the processes. At this time he read the works of Lémery, Neumann, Runckel, and Stahl, the latter of whom had been the principal champion of the phlogiston theory. Though his writings, at that time, were no longer new, they must have exerted a great influence upon Scheele, as would appear from theoretical speculations of the latter which are mostly based on those of Stahl. It is reported that Scheele experimented much during the night; even a reprimand which was once administered to him on account of an explosion was unable to cool off his ardor. After his apprenticeship of six years was completed, he remained two further years with his preceptor, and in 1765 took service under C. M. Kjellström, apothecary at Malmo, a progressive and well-informed man. Here he made the acquaintance of the learned A. J. Retzius (1742–1821), who was then "docent" at the University of Lund, and subsequently became professor of natural history and economy, later also of chemistry at Stockholm. After having revisited his native city Stralsund, he accepted an engagement with Stahrenberg, apothecary (at the sign of "The Raven"), at Stockholm. This was either in 1767, or '68, or '69. Being now in the capital, it was more easy for Scheele to make suitable acquaintances. Though his time was much taken up with his duties at the prescription counter, he nevertheless found leisure for study. It was at this period that he discovered tartaric acid. He also studied, in conjunction with his friend Retzius, the relation of quicklime towards calcium carbonate. On August 17th, 1768, his paper entitled "Chemical Results on Sal Acetosellæ" was read in the academy, but it was put aside on November 9th, after Bergman had declared that it contained nothing new.

While in Stockholm, Scheele made the acquaintance of a number of learned men, among them Abraham Bäck, an intimate friend of Linné, president of the medical college, and physician to the king; Peter Jonas Bergius, author of an excellent materia medica; Bengt Bergius, the learned historian; Carl Friedreich von Schultzenheim, celebrated surgeon, and director-general of hospitals; and many others.

In the fall of 1770, Scheele accepted the direction of the laboratory of the great pharmacy of Locke, at Upsala, and here he soon had the good fortune to acquire the friendship of Thorbjön Bergman, who had been appointed in 1767, rather unexpectedly, professor of chemistry, for which position he was eminently fitted by a most thorough preliminary training, which even comprised the mathematical sciences.

Carl Wilhelm Scheele.

Locke, whose laboratory supplied chemicals to Bergman, had noticed that saltpetre, when cautiously melted so as not to acquire an alkaline reaction, and then treated with acetic acid, gave out red vapors. Neither Bergman, nor his assistant Gahn could then give any explanation of this fact. Scheele, however, supposed it to be due to the formation of an acid, different from and weaker than nitric acid, having a relation to the latter similar to that which sulphurous acid has to sulphuric. When Bergman heard of this explanation he desired to form Scheele's acquaintance, which the latter at first conceded only with reluctance, remembering the report made on his paper on Sal Acetosellæ.

On July 27th, 1774, Scheele was proposed by Bergius as a Member of the Academy, and was elected on February 4th, 1775.

After having fairly made the acquaintance of Bergman, the most friendly relations were maintained between them, and Scheele had the free use of his laboratory. It is hard to say which of the two profited more from the other.

In 1775 he accepted for a short time the management of a pharmacy in Köping, and towards the end of 1776 or the beginning of 1777 established himself in business there.

On October 29th, 1777, he took his seat for the first (and only) time at a meeting of the Academy of Sciences, and on November 11th of the same year he passed the examination as apothecary before the Royal Medical College with the greatest honors. After his return to Köping, he devoted himself, outside of his business which consumed much of his time, to scientific researches, the fruits of which were laid down in a long series of important papers.

In the fall of 1785, Scheele began to be affected with an affliction, from the description of which it may be inferred that it was a disease of the kidneys. Some time during the beginning of the succeeding year, he also contracted a disease of the skin (pityriasis), which so enfeebled him, in connection with his other trouble, that he anticipated an early release from his sufferings. Three days before his death, he performed an act of generosity and magnanimity, characteristic of the time in which he lived, by marrying the widow of his predecessor, in order to insure her an undisputed title to his property. He departed this life on May 21st, 1786.

His brilliant discoveries and indefatigable zeal in research had procured him, during his short life, the acquaintance and friendship of the foremost scientists of his time, and had brought him many distinctions, in the shape of honorary membership in foreign learned societies. There has been no chemist living since his time who made so many important original discoveries as he.

It would exceed the limits of this sketch to discuss the contents of the several papers published by Scheele. For this we must refer the reader to Prof. Flückiger's memorial. We shall have to content ourselves with enumerating the titles of his papers, all published within fifteen years:

1. (1771) Fluospar and its Acid.—2. (1774) "Braunstein" or Magnesia [Manganese], two papers.—3. (1775) Benzoin Salt [Benzoic Acid].—4. Arsenic and its Acid.—5. Silica, Alumina, and Alum.—6. Urinary Calculi.—7. (1777) Chemical Treatise on Air and Fire.—8. (1778) Wet Process for Preparing Mercurius dulcis [Calomel]. 9. Simple Process for Preparing Pulvis Algarothi [oxychloride of antimony].—10. Molybdenum.—11. Preparation of a New Green Color.—12. (1779) On the Quantity of Pure Air daily present in the Atmosphere.—13. Decomposition of Neutral Salts by Lime or Iron.—14. Plumbago.—15. Heavy-spar.—16. (1780) Fluospar.—17. Milk and its Acid.—18. Acid of Milk-sugar.—19. On the Relationship of Bodies.—20. (1781) Tungsten.—21. The Combustible Substance in Crude Lime.—22. Preparation of White Lead.—23. (1782) Ether.—24. Preservation of Vinegar.—25. Coloring Matter in Berlin Blue.—26. (1783) Berlin Blue.—27. Peculiar Sweet Principle from Oils and Fats [Glycerin]—28. (1784) Attempt to Crystallize Lemon-juice.—29. Constituents of Rhubarb-earth [Calcium Oxalate] and Preparation of Acetosella Acid [Oxalic Acid].—30. The Coloring "Middle-salt" of "Blood-lye" [Yellow Prussiate of Potassium].—31. Air-acid [Carbonic Acid]; Benzoic Acid. Lapis infernalis.—32. Sweet Principle from Oils and Fats. Air-acid.—33. (1785) Acid of Fruits, especially of Raspberry.—34. Phosphate of Iron; and Pearl-salt.—35. Occurrence of Rhubarb-earth [see 29] in various Plants.—36. Preparation of Magnesia alba.—37. Fulminating Gold. Corn-oil [Fusel-oil]. Calomel.—38. Air-acid.—39. Lead-amalgam.—40. Vinegar-naphtha.—

* Prof. Flückiger has favored us with special copies of this lithograph, and we have caused it to be reproduced for our journal.

41. Lime. Ammonia or Volatile Alkali.—42. Malic Acid and Citric Acid.—43. Air, Fire, and Water.—44. (1786) The Essential Salt of Galls [Gallic Acid].—45 Nitric Acid.—46. Oxide of Lead. Fuming Sulphuric Acid.—47. Pyrophorus.—48. Peculiarities of Hydrofluoric Acid.

Behavior of Permanganate of Potassium towards Alkaloids.

SINCE it has been shown that permanganate of potassium is affected but slowly by pure cocaine, it has become a matter of interest to ascertain the behavior of this reagent towards other alkaloids. Prof. H. Beckurts, of Braunschweig, has made experiments in this direction, and the following is an abstract of the results obtained by him.

The tests were all made by adding to a saturated aqueous solution of the hydrochlorates of the several alkaloids a one-tenth-per-cent solution of the permanganate in drops.

Immediate reduction of the permanganate, with separation of brown manganic hydrate, took place in presence of quinine, cinchonidine, cinchonamine, cinchonine, brucine, veratrine, colchicine, coniine, nicotine, aconitine, physostigmine, codeine, and thebaine.

Solutions of the hydrochlorates of hyoscyamine, pilocarpine, berberine, piperine, strychnine, and atropine were colored at first red by the permanganate, and the latter was gradually reduced.

From solution of hydrochlorate of morphine, the permanganate separates a white crystalline precipitate of oxy-dimorphine, which, when filtered off and dried, may be recognized by its characteristic reactions.

Solution of hydrochlorate of apomorphine reduces the permanganate instantly, and acquires an intense dark-green color.

Narceine, *papaverine*, and *narcotine* exhibit a characteristic behavior similar to cocaine.

On adding to a concentrated solution of hydrochlorate of *narceine* a few drops of the permanganate solution, there is at once produced a precipitate having a reddish hue (like peach-blossoms). This precipitate is quite stable in absence of any excess of permanganate. If the latter is in excess, however, or if heat be applied, the precipitate is decomposed, and brown manganic hydrate separated.

In the same manner behave solutions of the hydrochlorate of *papaverine*, as well solutions of *narcotine* mixed with hydrochloric acid. Yet the resulting permanganates are much less stable than the corresponding salt of narceine. The precipitates rapidly lose their fine tint, and brown manganic hydrate makes its appearance.

New Method of Generating Hydrogen and Carbonic Oxide.

IF zinc-dust is mixed with calcium hydrate, obtained by moistening quicklime with a little water, sifting and drying at 100° C. (212° F.), and the mixture heated in a suitable furnace, so that the heat progresses uniformly from the remotest portion of the furnace outwards, a regular evolution of hydrogen gas takes place (according to H. Schwarz, in *Ber. d. D. Chem. Ges.*, 1886, 1140). The reaction which takes place is the following:

$$Zn + Ca(HO)_2 = ZnO + CaO + H_2$$

If zinc-dust is mixed with an equivalent quantity (1 mol.) of carbonate of calcium, and the mixture treated as above, carbonic oxide is produced.

$$Zn + Ca\,CO_3 = ZnO + CaO + CO$$

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 1,745.—**Tablet Composition** (B. and B.).

On page 73 of the advertisement columns of our issue for October, 1885, there appears a formula for a tablet composition, to be made from 1 part of sugar, 1 part of linseed oil, 4 parts of glycerin, 8 parts of glue, and a little aniline dye. It is directed to "cover the glue and gelatin with water." This should read: "glue *or* gelatin." Gelatin is merely a pure form of glue, and it might have been as well if we had written in the above formula: "8 parts of glue (or gelatin)."

No. 1,746.—**Rendering Paper-Labels Waterproof** (G. A.).

The label having been properly pasted on and dried, coat it first with a size prepared by adding as much alcohol to thick mucilage of gum arabic as this will stand without precipitating. When the sizing is dry, the label is brushed over with a solution of 50 parts of mastic and 1 part of storax in 165 parts of alcohol. In making the latter solution, it is recommended to add about 25 parts of sand, which mixes with the mastic and permits the alcohol to penetrate the mass more rapidly.

No. 1,747.—**Perfuming Furs** (Chic.).

This correspondent appears to be called upon to provide material, or, at least, to suggest ideas for perfuming furs, such as muffs, caps, tips, etc., and he asks us to give him a hint regarding the subject. He thinks that the object may be accomplished by placing some of the scented material between the lining. We believe ourselves that this would be the best method. The question would only be, in what shape the perfume should be used. It could not well be introduced in the form of an herb or a powder, as it would work its way through the lining some time or another. Perhaps a good plan would be to mix the perfume, in the shape of oils, with a solution of guttapercha in chloroform: pour the solution upon strips of twilled muslin, or chamois leather, or flannel, etc., and to allow it to evaporate spontaneously. The dry strips will retain the odor of the oils for a long time. If they are not absolutely dry, they may be laid between layers of dry flannel or other material.

No. 1,748.—**Copying Ink** (J. McJ.).

The simplest way of making copying ink is to evaporate any writing ink, made with iron and of good quality, from ten volumes to six volumes, and then to bring it back to its original volume by the addition of glycerin.

Other methods are the following:

1. Add to any good black writing ink one-third of its weight of sugar.

2. Dissolve 1 part of sugar in just the necessary amount of water and add 3 parts of glycerin. Mix the solution with an equal volume of good black writing ink.

3. 10 oz. of extract of logwood are boiled with 1 pint each of water and vinegar. To the strained decotion are added 1 oz. of green sulphate of iron, 5 oz. each of alum and gum arabic, and 10 oz. of sugar, and the whole raised again to boiling.

4. Boil 9 oz. of coarsely ground nut galls and 4½ oz. ground logwood with 12 pints of water down to 6 pints, and strain. Dissolve 4½ oz. of green sulphate of iron, 2½ oz. of sulphate of copper, 3½ oz. of gum arabic, and 1 oz. of sugar in 1½ pints of water; pour this solution into the strained decoction previously obtained, stir well, set aside for 24 hours, and filter through flannel.

No. 1,749.—**Prescription Query** ("A reader").

We are aware that physicians sometimes order injections containing sulphate of zinc and acetate of lead. They are probably not aware that there is a mutual decomposition, resulting in the production of insoluble sulphate of lead, and a corresponding quantity of acetate of zinc. As long as there is any soluble sulphate present, no lead salt can remain in solution; and as long as there is any lead salt in solution, no soluble sulphate can remain undecomposed. Omitting the water of crystallization of the salts, the reaction is:

$$\underset{\text{zinc sulphate}}{ZnSO_4} + \underset{\text{lead acetate}}{Pb(C_2H_3O_2)_2} = \underset{\text{zinc acetate (soluble)}}{Zn(C_2H_3O_2)_2} + \underset{\text{lead sulphate (insoluble)}}{PbSO_4}$$

Acetate of lead and sulphate of morphine are also often prescribed. In all these cases the physician should use the acetate of both bases.

We know a few physicians, however, who intentionally order sulphate of zinc and acetate of lead, and who direct their patients to shake the bottle just before using the contents for injection. They are aware of the incompatibility, but believe that there is some benefit derived from the insoluble sulphate of lead remaining in contact with the inflamed mucous membrane (of the urethra).

No. 1,750.—**"Condensed Beer"** (E. S. J.).

The "Concentrated Produce Company, of London" [and Brooklyn?], which has acquired an undesirable reputation in connection with the so-called hopeine put on the market by it, manufactures a "Condensed Beer," which is highly lauded in advertisements as a superior dietary article, and is recommended to physicians, chiefly on account of its high percentage of extractive of hop, as a superior soporific.

This "Condensed Beer" has recently been analyzed by Dr. R. Sendtner, of Munich (*Rep. d. Anal. Chem.*, 1886, No. 24). It is alleged to be prepared by concentrating English ale in a vacuum-apparatus, and is claimed to contain 24.01% of alcohol and 42.22 of extractive matters.

The analysis proved conclusively—from the relative quantities of the non-volatile constituents—that the Condensed Beer could not have been produced by evaporating ale, but is without doubt manufactured from extract of malt, by diluting this with alcohol and water, and allowing the mixture to age a little so as to lose the sharp taste of alcohol, or else—which is the same thing—by concentrating beer-wort in vacuo, and subsequently adding alcohol. "Condensed Beer" was found by the same chemist (as well as by others) absolutely free from any alkaloids, thereby disproving another one of the claims of the company. It was, however, found to contain salicylic acid.

No. 1,751.—**Reaction between Calomel and Chloride or Iodide or Bromide of Potassium** (O. W.).

Our correspondent asks: "Is calomel compatible with chlorides? So far as I am aware, it is incompatible with iodides. What are the changes produced? And how do bromides act when they come together with calomel?"

In answering these questions, we will begin with the iodide.

When calomel and iodide of potassium are triturated together, and when the calomel is in excess, there is a

transposition of constituents, and mercurous iodide and a chloride of the alkali are produced. The presence of the former is indicated by the greenish tint of the mass. It is quite probable that some biniodide is at the same time produced, and that some of it remains mixed with the protiodide, because it cannot be avoided that the calomel or the protiodide may come in contact at some portion of the mass during the trituration with an *excess* of the alkali iodide. The reaction which takes place, provided *only* the green iodide (mercurous iodide) is formed, is as follows:

$$Hg_2Cl_2 + 2KI = Hg_2I_2 + 2KCl$$

mercurous chloride (calomel) — potass. iodide — mercurous iodide (protiodide) — potass. chloride

If the two substances are brought together in equivalent proportions, as demanded by this reaction, viz.:

470.2 parts of calomel, and
331.2 parts of iodide of potassium,

it might be supposed that the whole of each compound were transformed, as shown by the reaction, and that there was, in fact, no more calomel or iodide of potassium left undecomposed. This is, however, not proven, nor is it quite likely, to judge from analogous examples. It is probable that the mutual decomposition progresses to a certain point where there is an equilibrium established, so that actually at least four different compounds may be present in the triturated mixture. We have not time to follow this question up at present, but would suggest that our correspondent examine the subject himself. One reason why we surmise that the decomposition is not quite complete is this: that the mercurous iodide produced is, according to all accounts, a trifle more soluble in water than the mercurous chloride from which it was produced.

Leaving speculation aside, we will continue our explanation.

Whenever the alkali iodide is in excess, the calomel, or rather the mercurous iodide produced from the latter in the incipient stage of trituration, is further changed to metallic mercury and biniodide of mercury. Consequently, the comparatively innocuous calomel will be converted into an active poison, the medicinal dose of which is quite small compared with that of calomel. The reaction is as follows, supposing the first step, viz., the production of mercurous iodide has already been accomplished:

$$2Hg_2I_2 + 2KI = 2(HgI_2.KI) + Hg_2$$

mercurous iodide (protiodide) — potass. iodide — potassio mercuric iodide — metallic mercury

The potassio-mercuric iodide is a compound of iodide of potassium and mercuric iodide (biniodide of mercury) which dissolves in the excess of iodide of potassium present, upon the addition of water.

When bromide of potassium is substituted for the iodide, the same decompositions occur, the mercurous and mercuric bromides being produced, the latter of which is as poisonous as the biniodide. The final reaction will be:

$$2Hg_2Br_2 + 2KI = 2(HgI_2.KI) + Hg_2$$

mercurous bromide — potass. bromide — potassio-mercuric bromide — metallic mercury

In the case of chlorides of alkalies, the conversion of calomel into corrosive sublimate occurs under certain circumstances. A solution of chloride of ammonium, for instance, particularly when concentrated, produces the change with comparative rapidity, though the first stage of the change is probably always the production of a double salt, containing still the mercurous radical. Solutions of chlorides of sodium and potassium act much more slowly. A dry mixture of calomel and some chloride probably remains unaltered for a long time; the stability may be insured by the addition of certain salts, such as carbonate of calcium. It is not advisable, however, to trust to a mixture containing calomel, which has been kept for some time. When freshly prepared, the calomel is unaffected, or not noticeably altered, and it should be administered only in this condition.

No. 1,752.—**Warburg's Tincture** (C. J. M.).

The original formula of Warburg's tincture was published by us in NEW REM., 1878, p. 248.

At the present time, the following formula is usually followed (the proportions being given in the U. S. weights and measures):

Aloes	224 grs.
Rhubarb	56 "
Angelica Seed	56 "
[Confection of Damocrates	56 "]
Elecampane	28 "
Saffron	28 "
Fennel	28 "
Prepared Chalk	28 "
Gentian	14 "
Zedoary	14 "
Cubeb	14 "
Myrrh	14 "
Camphor	14 "
White Agaric	14 "
Sulphate Quinine	150 "
Diluted Alcohol, enough to make	16 fl. oz.

Reduce the fibrous vegetable substances to a moderately coarse powder, add the aloes, myrrh, and camphor in small pieces, and digest the whole with the diluted alcohol in a well-covered vessel (or, better, in a flask provided with a return condenser) for twelve hours on a water-bath. Then add the sulphate of quinine, replace the vessel on the water-bath until the quinine is dissolved, and then set it aside to cool. Finally, add the chalk, mix thoroughly, and filter.

In place of the confection of Damocrates, which used to contain many ingredients now no longer obtainable, simple powdered opium may be used, if deemed necessary. The quantity of powdered opium equivalent to the 56 grs. of the confection of Damocrates is about 2 grains, and might probably be omitted altogether.

Some persons have a great aversion to aloes. In order to accommodate such, the tincture is also made without aloes.

Warburg's tincture is also often ordered to be evaporated to an extract, and the latter ordered to be dispensed in capsules. As it is rather wasteful to evaporate the tincture, which contains comparatively little solid matter in solution, it is better to prepare such an extract specially, and, as the extract may sometimes be required without aloes, it is preferable to leave this out, and to add it only when required, best in the form of aqueous extract of aloes, 16 oz. of which correspond about to 80 oz. of aloes.

No. 1,753.—**Oil of Cedar** (C. H.).

This subscriber says: "You will greatly oblige me by giving information as to the best and cheapest mode of manufacturing oil of cedar; also as to the parts used."

The original "cedar" is the well-known Biblical cedar of Lebanon (*Cedrus Libani* Barr.), which is a native of Syria. The wood of this tree has been renowned as a perfume from the most remote times. On distillation it yields an essential oil "which is very fragrant" (Piesse), and which is (or has been) used extensively for scenting "cold cream soap." Piesse states that this oil, the so-called otto of cedar-wood, has become very scarce. Yet we find it quoted in wholesale price-lists of the foremost manufacturers and dealers in essential oils at about $1.25 per pound in wholesale packages. That this oil is no longer derived from Lebanon cedar-wood is made evident by various circumstances, among others by the testimony of a very competent authority, namely, G. W. S. Piesse, in his "Art of Perfumery," where he says:

"Since the publication of the first edition of this work, otto of cedar-wood, *which was very scarce*, has been sent extensively into the market. Messrs. Piesse & Lubin have procured an average of 28 ounces from 112 pounds of shavings, being the refuse of the *pencil-makers*. The pencil-cedar is the 'Virginian' or American cedar, *Juniperus virginiana* L. The true cedar, *Cedrus Libani*, and from which the handkerchief perfume is '*named*,' yields a very indifferent otto and odor to the American plant. The 'Cedars of Lebanon' are so familiar, however, that perfumers could not afford to change the title of the scent they make for [from?] the red wood of the West, though the latter is superior to the former in fragrance."

There is a contradiction regarding the fragrance of oil of Lebanon cedar between this passage and that quoted before from Piesse's work. The fact is, the two oils resemble each other very much, and any difference or preference of one over the other is probably due to care in distillation, as well as to proper selection of the most suitable portions of the wood. Hirzel (in *Toiletten-Chemie*) says:

"Ethereal oil of cedar was formerly very scarce; now it may be obtained in large quantities. The wood of the American or Virginian cedar, also called 'lead-pencil cedar,' which is used largely by lead-pencil makers, is very rich in essential oil, 1,000 kilos (1 ton) yielding on distillation 1,700 Gm. (about 3¾ lbs.) of essential oil. The oil of the Virginian cedar does not differ much in odor from that of the Lebanon cedar; but all perfumes which bear the name 'Cedar of Lebanon' contain the oil of the American cedar, since the perfumers do not wish to alter the former name. The ethereal oil is prepared from the shavings and refuse of the lead-pencil works by distillation."

Considerable quantities of it are also obtained, as we learn from other sources, during the drying of the wood, and are collected by condensing the vapors escaping from the drying-rooms.

On the price-lists of wholesale dealers we also find "Oil of Florida Cedar," at about 90 cts. per lb. wholesale, and "Oil of American Cedar," at about 60 cts. per lb. The latter is said to be scarce, and often adulterated or substituted by common oil of turpentine. In just what way these two grades differ, whether they are obtained in a different manner, or whether one is a residue of the other, we are at present unable to say. At all events, our correspondent will have no difficulty in obtaining cedar-wood, either from lead-pencil works or from cigar-box manufacturers. The distillation, of course, is carried on as usual by distilling the wood with water, or passing steam through it.

It has also been reported that the essential oil obtained from the white cedar (*Cupressus thyoides* L.) has been sold as oil of cedar. (See Bailey in *Phil. Med. Rep.*, June 27th, 1872.)

No. 1,754.—**Estimation of Carbolic Acid** (U. S.).

Carbolic acid is best estimated by means of bromine, which converts it into tribromophenol:

Phenol.	Tribromophenol.
$C_6H_5.OH$	$C_6H_2Br_3.OH$
94.	331.

The usual method is to add to the aqueous solution containing the carbolic acid freshly-prepared bromine water in slight excess, allowing the mixture to stand some time, collecting

the precipitate on a filter, washing it with water, drying at 80° C. (176° F.), and weighing.

It has, however, been ascertained by Prof. Alfred H. Allen that the brominated compound obtained is too volatile to permit being dried without material loss. Besides, he believes it to be unstable in its nature, which is, however, probably not the case when it is derived from the purer grades of medicinal carbolic acids. With the less pure acids, and such as are usually put into ordinary carbolic soaps, the compounds may indeed be of variable character. Prof. Allen's statement just quoted is contained in a recent paper published by him in *The Analyst* (1886, 103), and entitled "The Assay of Carbolic Soap." From this paper we quote the following passages:

"Although the coal-tar acids are added to the soap in a free state, the free alkali so frequently present prevents them from continuing to exist wholly in that condition. This is important, as the antiseptic virtues of the alkaline carbonates and cresylates are of a very doubtful nature. Analytically, also, the fact is of interest, for phenols existing in combination will not be dissolved out on treating the dried soap with petroleum ether, in the manner recommended by Prof. Leeds and Dr. Wright.

"The process for determining phenols which I now employ is as follows:

"5 grammes weight of the sample is dissolved in warm water, with addition of from 20 to 30 C.c. of a 10-percent solution of caustic soda, according to the proportion of phenols believed to be present. The cooled solution is then agitated with ether, and the ethereal layer separated and evaporated at a low temperature. The weight of the residue gives the amount of hydrocarbons, etc., in the quantity of the sample taken. The odor towards the end of the evaporation, and that observed on heating the residue, will give considerable information as to the nature of the admixture. Odors suggesting gas-tar and burning guttapercha are very common. The alkaline liquid separated from the ether is then treated in a capacious separator with an excess of strong brine, which completely precipitates the fatty acids as sodium salts. The liquid is well agitated to cause the soap to filter, and is then passed through a filter. In cases where the soap does not readily coagulate, an addition of a small quantity of tallow or palm-oil soap, previously dissolved in water, will usually overcome the difficulty. The precipitated soap is washed twice by agitating it with strong brine, the washings being filtered and added to the main solution, which is then diluted to 1 liter. 100 C.c. of this solution (= 0.5 gramme of the sample of soap) is then placed in a globular separator, and acidulated with dilute sulphuric acid, when it should remain perfectly clear. Standard bromine water is then added from a burette, the stopper of the separator inserted, and the contents shaken vigorously. More bromine water is then added, and the agitation and addition of bromine solution repeated alternately until the liquid acquires a faint but permanent yellow tint, showing that a slight excess of bromine has been used. If *crystallized carbolic acid* has been employed for making the soap, the *bromo-derivative* is precipitated in *snow-white, crystalline flocks*, which allow the faintest yellow tint due to excess of bromine to be observed with great facility."

The bromine solution is recommended by Prof. Allen to be standardized, not absolutely (as, for instance, by means of solution of iodide of potassium and volumetric solution of hyposulphite of sodium), but by comparing it with a solution of a known quantity of a carbolic acid of about the same grade as that which is to be examined. This method will, no doubt, eliminate considerable errors when assaying the less pure grades of carbolic acid, but it will hardly be necessary to employ it with medicinal acid. In this case, a further recommendation of Prof. Allen, published in the same paper, may be followed. According to this, the aqueous liquid is acidulated with dilute sulphuric acid, and bromine water added in slight excess.

Bisulphide of carbon is now added, the whole agitated, and the bisulphide then drawn off. The treatment with the bisulphide is repeated until the liquid is freed from the bromo-derivatives, and has lost its red or yellow color due to free bromine. The bisulphide solution is allowed to evaporate spontaneously, when the residue will represent the bromo-derivatives obtained. In the case of the purer carbolic acid, this may be regarded as tribromophenol.

The volumetric assay of carbolic acid or phenol is usually performed as follows:

A solution of bromine is prepared containing 8 grammes of pure bromine in 1 liter. To obtain this, dissolve 9 Gm. of bromine and 20 Gm. of bromide of potassium in a small quantity of water, and dilute the solution to 1,000 C.c. Next add to a watery solution of about 1 Gm. of iodide of potassium, contained in a flask, 10 C.c. of the above bromine solution, and estimate the separated iodine by means of a one-tenth normal solution of hyposulphite of sodium. Upon the results thus obtained—as one equivalent of bromine displaces exactly one equivalent of iodine—the bromine solution is adjusted so as to contain 0.008 Gm. of bromine in each cubic centimeter.

In our experience, however, it is better to use a bromine solution of *approximately* the strength just mentioned, without being exactly adjusted to it, for the reason that the titer of the solution changes very rapidly through loss of bromine. If the bromine solution is assayed just before and immediately after it is used, and the mean of the two figures taken, the results will be found quite accurate.

In order now to assay a solution of carbolic acid by means of this bromine solution, add the latter to the aqueous solution of the acid, with constant agitation (in a flask) until the liquid surrounding the whitish precipitate has a faintly yellow color, due to a slight excess of bromine, and a drop of it imparts immediately a deep-blue color to a little solution of iodide of potassium and starch. Towards the end of the reaction of bromine upon the carbolic acid, a few minutes ought to be allowed to elapse after the addition of each instalment of bromine water, before the test with iodide and starch is applied. The reason is that the bromine acts then more slowly upon the carbolic acid, in consequence of the great dilution of the latter. Excepting when bromine solution is allowed to run into the flask, the latter must be kept tightly corked, especially after bromine has been added in excess. Should too great an excess of bromine have been added, it is best to add a measured quantity of a solution of pure carbolic acid of known strength, and then again bromine water, with greater caution until not more than a *slight* excess is present.

From the amount of bromine present in the volume of bromine water consumed, we calculate the quantity of carbolic acid. As will be seen from the following equation, 1 mol. of phenol reacts with 6 molecules of bromine:

$C_6H_5.OH$	+	$6Br$	=	$B_3H_2B_3.OH$	+	$3HBr$
phenol		bromine		tribro-mophenol		hydro-bromic acid

Formulæ and Information Wanted.

1. *Rolling Mill Crayons.* One of our correspondents wants to know who the manufacturer of these crayons is. They are 5 inches long, 1¼ wide, and $\frac{3}{16}$ thick, and come packed 1 gross in a box.

2. *Wright's Indian Vegetable Pills.* What are the ingredients?

3. *Elixir ferrugineux de Rabuteau.*

4. *Hayden's Viburnum Compound.*

5. *Almond Paste.* Information wanted how this article, which is sold by dealers in confectioners' supplies (for the baking of maccaroons), is prepared.

6. *Sawyer's Sick Headache Powders.*

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UMRISSE DER GESCHICHTE DER PHARMACIE-SCHULE IN STRASSBURG. Von Prof. F. A. FLUECKIGER. 8vo, Strassburg, 1885. (Reprint.) [Received from the author.]

LA MORTOLA. Der Garten des Herrn Thomas Hanbury, Ritter d. S. Mauritius-, etc., Ordens. Von F. A. FLUECKIGER, Dr. Phil. u. Med., Professor in Strassburg (April, 1884). 8vo, Strassburg, 1886. With three illustrations. (From the author.)

THIS is a finely printed pamphlet, giving a description of Mr. Thomas Hanbury's charming villa (Plazza Orengo) and grounds, bordering upon the village of Mortola, near the sea coast of the Mediterranean, in the Gulf of Mentone. Most of the text is devoted to a description of the flora collected in the gardens, which is without doubt one of the richest and most magnificent collection in the possession of a private owner.

GOTTHILF HEINRICH ERNST MUEHLENBERG ALS BOTANIKER. Vortrag gehalten vor dem Pionierverein zu Philadelphia, am 6 Mar., 1886. Von J. M. MAISCH, Pharm.D., Prof. am Philadelphia College of Pharmacy, etc. 8vo, New York, 1886. (Reprint from Dr. Fr. Hoffmann's *Pharm. Rundschau*, June, 1886.)

AMERICAN MEDICINAL PLANTS: An Illustrated and Descriptive Guide, etc., by DR. MILLSPAUGH. New York and Philadelphia: Boericke & Tafel. 1886. Fascicle IV. (Nos. 16-20).

WE have already had the pleasure of noticing the publication of this beautiful series of plates accompanied with descriptive text. The portion last received comprises the following subjects:

A plate and text of Rhus aromatica, to accompany fascicle III., Ailanthus gland., Aletris farinosa, Archangelica atrop., Celtis occid., Capsella Bursa-Past., Chionanthus virg., Cornus circinata, Cornus sericea, Cicuta maculosa, Euphorbia Ipecac., Euonymus atrop., Gymnocladus can., Genista tinct., Ginseng, Juniperus virg., Magnolia glauca, Menispermum can., Menyanthes trifol., Myrica cerifera, Opuntia vulgaris, Ostrya virgin., Pirus Amer., Pastinaca sativa, Rhamnus cath., Rhus venenata, Ranunculus bulb., Ranunculus rep., Senega, Serpentaria, and Veratrum viride.

Myrtol is the latest antiseptic and disinfectant. It is recommended by Dr. Linarix in subacute and chronic catarrh of the respiratory organs, after the cessation of fever, and should be taken in doses of about 2½ grains (in capsules) before meals.—*Deutsche Med. Zeit.*

We have not yet seen Dr. Linarix' original dissertation, but presume that the myrtol meant by him is the stearopten of oil of myrtle (from *Myrtus communis*). Oil of myrtle is a regular article of trade and may be obtained from all respectable dealers in essential oils.